THE IRON TRADE REVIEW

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THE WEEK IN IRON CIRCLES.

THE MARKET AT LARGE.

Quietness with sustained strength characterizes the iron market. There is activity that not long back would have have been considered noteworthy, but in comparison with the record of March, which in pig iron was unprecedented, the current buying is light. Mills are running to their utmost capacity on nearly all descriptions of products, though in plates there is not the accumulation of orders that was noticed in the winter and early spring. Rail business has not been cut off by the advance, but it is now evident that further new business for delivery this year must be taken care of in mills east of Pittsburg. The course of pig iron production is being watched with interest by the trade. Buyers seem to be proceeding on the assumption that consumption will be overtaken shortly and that the active blast furnace capacity will be sufficient to preserve stable prices through the year—at least to guarantee against any material advance. Two of the large new Central Western furnaces have just gone into blast; another is to follow shortly and others will come later in the year. It is already evident that the United States Steel Corporation will not be in the market for as much pig iron in the second half of the year as it bought for delivery before July 1. Foundry buying keeps up, though at a slackened pace and the melt of iron in foundry cupolas is probably in excess of any record yet made. There is still some slight inequality in prices, due principally to the offering of No. 3 and No. 4 Southern irons below recent quotations. Pipe works have taken up these offerings, and on the higher grades the well sold condition of the furnaces has maintained an even level. Eastern markets and those affected by the slack condition of the textile trade are not quite up to the Central Western standard. In finished material probably bars have been the most active feature in the week, a good business coming in the wake of the large contracts of implement manufacturers. It is estimated that about half the requirements in this direction have been covered and that most of the remaining contracts that were placed in July and August last year will be closed this month. Sheet and tin-plate works are being driven to their full capacity. It is the expectation that a basis will be agreed upon with the Amalgamated Association that will obviate the necessity of a shutdown on July 1, pending the adjustment of the scale, putting that organization in line with the conciliation movement which looks to a continuance of operations pending all adjustments of labor questions. The possibility of machinists' strikes at various points, on May 20, is one element of uncertainty in the situation. The 9-hour day and increased wage will be granted in some cases, it appears, but the majority of employers are expected to refuse the double concession. The foreign iron trades show slight improvement. In Germany the feeling is stronger, and British market reports indicate a better tone in some districts, in spite of a falling off of British iron and steel exports from 962,457 tons in the first quarter of 1900 to 616,826 tons in the first three months of this year.

PITTSBURG.

OFFICE OF *The Iron Trade Review*,
429 PARK BUILDING, May 8.

During the past week the National Tube Co. purchased the entire output of iron skelp of the Valley mill of the Republic Iron & Steel Co. at Youngstown, O., for a period of six months. It is estimated that the output of this mill for this period will be about 15,000 tons. This mill has been shut down for more than a year and it was believed that it would soon be abandoned. However such market conditions as exist at the present time necessitate the operation of every mill that can be secured. One of the interesting features of this contract is the fact that it has been practically closed between the United States Steel Corporation and one of its largest competitors. Another interesting development of the week is the purchase of a considerable tonnage of coke by the National Steel Co. for periods extending from three to six months. This move is not generally understood by the outside coke producers who believed that hereafter their trade with the constituent companies of the United States Steel Corporation would be cut off entirely. It is conjectured, however, that the various coke plants of the United States Steel Corporation will continue to cater to their outside trade as much as ever and that the National Steel Co. is buying to cover a shortage which the coke ovens of the combine are unable to provide. Another large blast furnace of the United States Steel Corporation was lighted for the first time last week. It is located at Mingo Junction, O., and was built by the National Steel Co. It will have an output of Bessemer of about 600 tons daily. The Neville Island furnace of the combine erected by the American Steel & Wire Co. will also go into blast within a month with a daily capacity of about 700 tons and upon the completion of the improvements to the two Carrie furnaces of the Carnegie Steel Co. at Rankin in six months, the United States Steel Corporation would be compelled to buy less than 1,000,000 tons of iron a year in the open market with all steel plants operating in full. The construction of another furnace plant as large as the Carrie plant when completed would place the combine in a position entirely independent of the pig iron market and whether this policy will be pursued or not is of great interest to the Valley furnacemen. The Eliza plant of Jones & Laughlins, Ltd., is now on in full. The fourth furnace was put in blast this week, making this large consumer entirely independent of the pig iron market. At a meeting of the freight rate officials of the central and trunk line railroads held in New York last week the request for a reduction in freight rates on pig iron, ore, limestone and other raw materials from the Ohio lake ports to the Valley furnaces and from the latter to Pittsburg was refused. This action was taken despite every indication that the traffic this year throughout this territory will break all previous records, which will necessarily reduce carrying costs to the railroads. In finished lines the market continues strong, with steel bars, structural material and plates the features in the order named. Fully half the requirements of the agricultural implement manufacturers in steel bars have been contracted for and before the end of this month it is probable that this trade will have all its requirements covered. Orders for structural material continue to come in at a lively rate and it is estimated that contracts for about 15,000 tons were closed by Pittsburg manufacturers during the past week. A meeting of the plate manufacturers was held last week in New York, but nothing was done regarding prices. The largest producer of pipe and tubing has closed several large contracts during the week for oil well casing for the Texas field.

In raw materials there is little doing. The sales of Bessemer iron will hardly aggregate 5,000 tons, at $16.25 per ton at the furnace. The United States Steel Corporation purchased about 10,000 tons of basic iron in the East and South and it is reported to be in the market for an additional tonnage of about the same amount. During the coming week a meeting will be held between a committee of the iron and steel manufacturers and the Amalgamated Association for the purpose of formulating a proposition providing for the continuous operation of the mills controlled by the association, pending a settlement of the annual wage scale. There is little doubt that a proposition satisfactory to both parties can be agreed upon and which will be accepted at the annual convention of the Amalgamated Association to be held the latter part of this month in Milwaukee.

PIG IRON.—Outside of the purchase of 10,000 tons of basic iron by the United States Steel Corporation from producers in the East and South there has been little doing in the pig iron market. The sales of Bessemer iron will hardly aggregate 5,000 tons for delivery during the present month and June. No. 2 Foundry is selling quite firm at $15.25 to $15.50 and we note the sales of about 3,000 tons for delivery during the end of the second quarter and through the third quarter. We also note the sale of a 500-ton lot of forge iron at $14.50, Pittsburg, and a number of smaller lots aggregating 1,000 tons at $14.75, Pittsburg. Demand for second half delivery for Bessemer has not yet set in and while it is believed that the price will be $16 at the furnace, it is thought that a slightly lower price could be had on a large tonnage. We revise quotations as follows:

Bessemer, Valley, second quarter	$16 25
Bessemer, Valley, third quarter	16 00
Bessemer, Pittsburg	$16 75 to 17 00
No. 1 Foundry	15 50 to 16 00
No. 2 Foundry	15 25 to 15 50
No. 3 Foundry	14 75 to 15 00
Gray Forge, Pittsburg	14 50 to 14 75

STEEL.—While there is considerable demand for both Bessemer and open-hearth billets for spot shipment there is only a limited tonnage to be had. We note the sale of several 100-ton lots of Bessemer billets at $25 at the furnace; the sale of several carload lots of open-hearth billets at $28 at the mill. Inquiry for second-half delivery has not yet developed.

FERRO-MANGANESE.—We continue to quote domestic 80 per cent at $58.50 per ton delivered in carload lots, at buyer's mill. We have been advised that German producers have not been offering their product during the past week and have stopped shipment owing to the late reduction in price.

SPELTER.—The spelter market still continues to rule weak, with little buying to stimulate prices. During the past few days, however, there have been spasmodic indications of strength and prices are ruling about 5 cents higher than last week. We quote prime Western grades at 4.01c, Pittsburg.

MUCK BARS.—Muck iron continues a scarce commodity and a small lot of several hundred tons was sold during the week at $28.

SKELP.—One of the largest contracts for skelp closed for some time was made by the National Tube Co. during the past week with the Republic Iron & Steel Co. It calls for about 15,000 tons of iron skelp of medium width for delivery during the next six months. The material will be rolled at the Valley mill of the Republic Iron & Steel Co. at Youngstown, O. We quote grooved and sheared iron skelp at 1.85c to 1.90c and grooved and sheared steel skelp at 1.75c to 1.80c.

RAILS AND TRACK MATERIAL.—The demand for light rails on the part of the coal producers continues strong and mills cannot promise shipment in less than one or two months. There has not been new business in standard section rails and it is doubtful whether any considerable business will be placed within the next few months. Demand for track material, such as spikes and bolts continues extremely strong. We make the following quotations: Rails, standard sections, 50 pounds and over, in lots of 200 tons and over, $28; car lots and less than 200 tons, $30; less than car lots, $32; light rails, 12 pounds, $37; 16 pounds, $35; 20 pounds, $34; 25 to 40 pounds, $40. Track material: Spikes, 1.95c to 2c; track bolts, square heads, 2.60c; hexagon heads, 2.70c; fish plates, 1.60c to 1.70c.

PLATES.—At a meeting of the plate manufacturers held in New York last week ruling prices were reaffirmed. Considerable new business continues to be placed and mills in this district have orders on their books sufficiently large to keep their mills in operation during the next 60 days. Owing to the pressing domestic demand for plates the mills are not seeking for foreign business, although the offerings are not as large as they have been during the past three months. We make the following quotations: Tank plate, ¼-inch thick up to 100 inches in width, 1.60c at mill, Pittsburg; flange and boiler steel, 1.70c; marine, ordinary firebox, A. M. B. A. specifications, 1.80c; still bottom steel, 1.80c; locomotive firebox, not less than 2.10c; and it ranges in price to 3c. Plates more than 100 inches wide, 5 cents extra 100 pounds. Plates 3-16 of an inch in thickness, $1 extra; gauges Nos. 8 and 9, $2 extra. These quotations are based on carload lots, with 5 cents extra a hundred pounds for less than carload lots. Terms, net cash in 30 days.

BARS.—The agricultural implement manufacturers continue to place contracts for their requirements during the next year and it is estimated that fully half of the bars required have already been contracted for. Last year when the market was declining the agricultural implement men waited until rock bottom prices were reached and did not place their business until July. Conditions are different this year. On large contracts 1.40c is quoted, while the bulk of small business in steel bars is being placed at 1.45c to 1.50c. The demand for iron bars is reported strong and they are held at 1.50c to 1.60c, delivered, Pittsburg. We quote refined iron bars at 1.75c to 1.90c, Pittsburg.

SHEETS.—Deliveries on sheets cannot be made on new business in less than 60 days. The same holds good on tin plate. Owing to the immense demand for both these products the manufacturers are hoping that the non-interruptive clause will be adopted by the Amalgamated Association which will permit of the operation of their mills during the settlement of the annual wage scale. Should the mills be closed down the consumers now placing their business would be compelled to wait until September or October for deliveries. Our quotations in carload lots are as follows: Black sheets, one pass through cold rolls, No. 30, 3.65c; No. 29, 3.55c; No. 28, 3.35c; No. 27, 3.25c; Nos. 25-26, 3.15c; Nos. 22-4, 3.05c; Nos. 19-21, 2.95c; Nos. 17-18, 2.80c; Nos. 15-16, 2.70c; Nos. 13-14, 2.60c; Nos. 10-12, 2.50c. For more than carload lots a reduction of 5 cents per 100 pounds is made; for less than carload lots an advance of 15 cents per 100 pounds over the above price is asked. Galvanized sheets are strong at 70 and off.

PIPES AND TUBES.—The Texas oil field has resulted in an immense demand for oil well casing. Thousands of tons of this material are being rushed to this Southern district and on nearly all orders prompt shipment is asked. The National Tube Co. is doing an immense business at the present time in other lines. Prices continue unchanged. Discounts to consumers, Pittsburg, in carload lots are as follows:

MERCHANT PIPE.

	Carload lots. Black	Carload lots. Galv.	Less than carload lots. Black	Less than carload lots. Galv.
	Per cent.	Per cent.	Per cent.	Per cent.
⅛ to ½ and 11 to 12 in.	59.2	46.2	54 9	40 9
¾ to 10 inches	66.7	53-3	61.9	49 9

BOILER TUBES.

	22 Feet and under. Per cent. Iron.	Steel.
1 to 1¾ and 2¾ to 5 inches, inclusive	43½	65½
2 to 2½ inches, inclusive	43	60
6 inches and larger	53	59

CASING.

	S. and S. Per cent
2 to 3 inches	58
3¼ to 4 inches	63
4¼ to 12¾ inches	65

O. D. PIPE.

	Per cent.
14 to 22 Isches	42
24 inches, o d. and larger	37

THREADS AND COUPLINGS.

	Per cent.
14 to 16 inches o. d	35

STRUCTURAL MATERIAL.—It is estimated that fully 15,000 tons of structural material in new contracts was placed with Pittsburg manufacturers during the past week. The American Bridge Co. has received contracts for about 6,000 tons of material for bridges from the Norfolk & Western and the Nickel Plate railroad. Prices remain unchanged as follows: Beams and channels, 3 to 15 inches, 1.60c; 18 to 24 inches, 1.70c; tees, 1.65c; zees, 1.60c; angles, from 3 to 6 inches, 1.60c; universal mill plates, 1.60c.

WIRE AND WIRE NAILS.—Demand for wire products con-

tinues strong while the demand for nails, both wire and cut, on account of the immense amount of building this year is unprecedented. Prices continue as follows: Single carloads of wire nails to jobbers, $2.30, Pittsburg; to retailers, $2.40, plain wire, carload lots, is now quoted at $2.25 to jobbers and $2.35 to retailers; painted barb wire, $2.60 in carload lots to jobbers, and $2.70 to retailers; galvanized barb wire, $2 in carload lots to jobbers, and $3 to retailers. Cut nails are quoted at $2, Pittsburg, in carload lots, 2 per cent off in 10 days.

MERCHANT STEEL.—The agricultural implement manufacturers have given the Crucible Steel Co. of America contracts for a large tonnage of plow slabs and other material made of the finer qualities of steel to be used in the manufacture of agricultural implements. The demand for shafting is strong with prices unchanged. We make the following quotations: Turned, cold rolled and ground shafting at 55 per cent off for car lots and 50 per cent off for less than car lots; tire steel in carload lots and over, 1.70c; less than carload lots, 1.75c. Toe calk is held at 1.75c in large lots, and in small lots as high as 1.85c. Tool steel is held at 7c and upwards, according to quality; hoops and bands, 1.95c to 2c.

OLD MATERIAL.—There is little doing in old material, but the market continues fairly strong with practically unchanged quotations. We quote the following prices, gross tons: Heavy melting stock, $17.25 and $17.50; low phosphorus melting stock, $20 to $21; steel rails, $17 to $17.50; busheling scrap, $14.75 to $15; No. 1 wrought, $17 to $18; iron rails, $22 to $23; cast borings, $8.50 to $9; cast scrap, $14.25 to $14.50.

COKE.—For the week ending April 27, the production of the Connellsville region is estimated at 237,101 tons. This breaks the highest previous record by more than 800 tons. The demand for coke for immediate delivery is unprecedented and premiums are being paid on small lots. Outside furnace coke for second half delivery will command from $1.90 to $2 per ton. Foundry coke now commands $2.25 per ton, while strictly Connellsville furnace coke is held at $2.10 to $2.15 and foundry at $2.50 per ton.

CHICAGO.

OFFICE OF *The Iron Trade Review*,
534 MONADNOCK BLOCK, May 7.

Notwithstanding the increase in the price of steel rails which recently went into effect, there is no diminution in the number of inquiries. A number of large roads are asking for the earliest deliveries obtainable and are offering premiums to get desired shipments. With Central, Western and Chicago mills sold up until the first of the year, however, there is little prospect that any deliveries can be made until after the first of January next, except from mills east of Pittsburg. The demand for bars has subsided somewhat and sellers now have a chance to breathe and find out where they are at. The market in old material has grown still weaker, and it is expected that another reduction in prices will be made this week.

PIG IRON.—The market continues quiet, though prices are firm. A little buying has been done by agricultural implement manufacturers and small orders from foundries continue to come in. We quote prices, unchanged, as follows:

Lake Sup. Charcoal	$18 00 to $19 00	Southern Coke No. 4	$ 4 40 to $14 65
Local Coke Fdy. No. 1	16 00 to 16 50	Southern No. 1 Soft	15 90 to 16 15
Local Coke Fdy. No. 2	15 50 to 16 00	Southern No. 2 Soft	15 40 to 15 65
Local Coke Fdy. No 3	15 00 to 15 50	Southern Silveries	15 90 to 16 15
Local Scotch Fdy. No 1	16 00 to 16 50	Jackson Co. Silveries	17 50 to 18 00
Local Scotch Fdy No 2	15 50 to 16 00	Ohio Strong Softeners	16 50 to 17 00
Local Scotch Fdy No. 3	15 00 to 15 50	Alabama Car Wheel	21 00 to 22 00
Southern Coke No. 1	15 90 to 16 15	Malleable Bessemer	16 50 to 17 00
Southern Coke No. 2	15 40 to 5 65	Coke Bessemer	17 50 to 18 50
Southern Coke No. 3	11 90 to 15 10		

BARS.—The demand has not been very large during the past week and no important sales have been made. A few agricultural implement concerns have not yet placed their contracts and a number of carriage manufacturers are asking for bids. The orders that have been booked are mostly small lots and for early delivery. Prices are firm at 1.55c to 1.60c for iron and 1.60c to 1.65c for steel.

STRUCTURAL MATERIAL.—The bulk of the business has consisted of small and medium sized orders which aggregate a fairly large tonnage. Mill shipments are quoted as follows: Beams, 15 inches and under, 1.75c; 18 inches and over, 1.85c; angles, 1.75c to 1.80c; plates, 1.75c; tees, 1.80c; zees, 1.75c; small lots from store, ¼ to ½c higher.

SHEETS.—Manufacturers are still battling with the problem of delivery. There is a steady flow of orders and inquiries, with urgent demands for prompt shipment. We quote prices as follows: No. 27 black, 3.40c to 3.50c, and galvanized is held at 70, 5 and 2½ per cent, Chicago.

BILLETS.—Few mills have billets to sell. Inquiries, however, continue numerous and a few small orders have been closed. We quote Bessemer billets $26 to $27, Chicago.

RAILS AND TRACK SUPPLIES.—The recent increase of $2 per ton has not shut off inquiries for this material. Several large roads are reported asking for the earliest deliveries obtainable and are offering premiums to get desired shipments. Most of the mills have sold their capacity for the year, though one seller reports having booked a few small orders for late delivery. There is a heavy demand for all kinds of track supplies, though in this line desired shipments are hard to get. We quote prices as follows: Standard rails, $28; light sections, $26 to $30; splice bars, 1.60c to 1.70c; spikes, 1.90c to 2c; track bolts, hexagon nuts, 2.70c to 2.80c; square nuts, 2.55c to 2.65c.

PLATES.—There has been little business transacted during the past week. One manufacturer reports a part of his capacity for the last months of the year unsold. Prices are unchanged, as follows: Mill shipments, Chicago delivery, are quoted as follows: Tank steel, 1.75c; flange steel, 1.90c to 2c; marine steel, 1.95c; firebox steel, ordinary, 2c to 2.10c; firebox special, 2.25c and upwards.

MERCHANT STEEL.—A continued good demand is reported for this material. Some further contracts with the implement trade have been closed and a large number are still pending. Prices remain firm and unchanged, as follows: Mill shipments, Chicago delivery, smooth finished tire steel, 1.90c to 2c; open-hearth spring steel, 2.50c to 2.75c; toe calk, 2.40c to 2.60c; sleigh shoe, 1.85c to 1.90c; cutter shoe, 2.40c to 2.60c; ordinary tool steel, 6c to 7c; specials, 13c and upwards. Cold rolled shafting, 55 per cent and upwards.

MERCHANT PIPE.—From all parts of the country there is a heavy demand for pipe for drainage purposes. Manufacturers are behind in shipments. We quote random lengths, Chicago delivery, as follows:

MERCHANT PIPE.

	In carloads.		Less than carloads.	
	Blk.	Galvd.	Blk.	Galvd.
½ to ⅜ inch and 11 to 12 inches	59.2	46 2	54.9	40 5
½ to 10 inches	66.7	53 3	61.9	49 9

WIRE AND WIRE NAILS.—Urgent appeals for prompt shipment continue to come in from all branches of the manufacturing trade. New business is plentiful, but it is impossible to give buyers delivery within three months at the very least. Prices are unchanged, as follows: Carloads of wire nails to jobbers, $2.40, Chicago; to retailers, $2.50; plain wire, carloads to jobbers, $2.35; to retailers, $2.45; painted barb wire to jobbers, carloads, $2.70; to retailers, $2.80; galvanized barb wire, carloads to jobbers, $3; to retailers, $3.10.

OLD MATERIAL.—It is expected that there will be a general slump in prices, averaging $1. There is little demand for old material of any kind. Dealers' selling prices per gross ton, are as follows:

Old iron rails	$20 00 to $21 00	Old Wheels	$17 00 to $18 00
Old steel rails, long	15 00 to 16 00	Heavy melting steel	14 00 to 14 50
Old steel rails, mixed	14 00 to 15 00	Mixed country steel	10 00 to 10 50
Relaying rails	20 00 to 22 00		

The following are selling prices per net ton:

No. 1 R. R. wrought	$15 00 to $15 50	Iron axles	$20 00 to $21 00
No. 2 R. R. wrought	13 00 to 13 50	Cast borings	4 00 to 4 50
Dealers' forge	12 50 to 13 00	Wrought turnings	9 00 to 9 50
No. 1 busheling	11 50 to 12 00	Iron axle turnings	10 50 to 11 00
Heavy cast	11 50 to 12 00	Steel axle turnings	9 50 to 10 00
Railway malleable	12 50 to 3 00	Stove plates	8 50 to 9 00
Country malleable	11 50 to 12 00	Old iron splice bars	17 00 to 17 50

CLEVELAND.

OFFICE OF *The Iron Trade Review*,
1064 ROSE BUILDING, May 8.

In the week some further chartering has been done by ore shippers, Ashland business being done for the first time. The rate, as heretofore, from head-of-the-lake ports was 80 cents. Escanaba tonnage was taken at 60 cents. There seems to be no anxiety on the part of shippers to make contracts, in spite of the late opening, and it is believed more wild chartering

than usual will be done this season. The ice jam above Detroit and the engineers' strike are combining for a very late opening. It is likely to be May 15 before ore is unloaded at Lake Erie docks. Last year the ore movement in April was about 300,000 tons from upper lake docks, and it is probable the lead of 1900 will be increased to 1,800,000 tons before any ore is moved this year, May, 1900, showing a total of 3,000,000 tons. Further efforts at an adjustment between the United States Steel Corporation and its marine engineers are now being made with better indications of success.

PIG IRON.—There is regular buying of foundry iron, though the business seems light in comparison with the unprecedented volume of March and the early portion of April. As a rule foundries are still keeping this side of July 1 in their contracts, and are hurrying up shipments of iron for current needs. The market for Bessemer continues very quiet and developments concerning the second half of the year are not expected immediately. The requirements of the United States Steel Corporation are quite certain to be less in the second half of the year than in the first, one large new furnace having gone in within the week, while another will be started soon. We quote $16.25 at Valley furnace for Bessemer for early shipment. Foundry iron is generally quoted $14.50 at Valley furnace, though some sales are made below this figure. Southern No. 2, at $11.75 Birmingham, is $15.45, Cleveland, but this has been shaded. Gray forge is very scarce and $14 Valley furnace is minimum. Southern is delivered at Valley mills at $14. Lake Superior charcoal is somewhat in demand and the price is well maintained. We note sales at $18 on Lake Erie dock. Cleveland quotations follow:

Bessemer	$16 50 to $17 00	Valley Scotch No. 1	$15 25 to $15 75
No. 1 Strong F'dry	15 25 to 15 75	Valley Scotch No. 2	14 75 to 15 00
No. 2 Strong F'dry	14 75 to 15 00	Gray forge, Valley	13 73 to 14 00
No. 3 Foundry	14 25 to 14 50	Lake Superior charc'l	18 00 to 18 50

FINISHED MATERIAL.—The rush of rail buying by Cleveland trolley line syndicates is over. In general, there is steady ordering and specifying for bars, sheets, tubes, plates and structural material. There has been a slight easing on bars. The big agricultural buyers did business with Pittsburg at 1.40c for steel, and on 1,000- to 3,000-ton orders from other interests contracts have been made at 1.40c to 1.45c. Bar iron contracts can be made at 1.45c Valley mill on round lots, though 1.50c is still asked on car-lot orders. From store, Cleveland, 1.70c, half extras, is the basis. Plate mills are in easier condition and orders can be readily placed for 30-day deliveries. Specifications on large plate contracts are evidently not quite up to expectations. Local building operations are on a large scale, but the steel was bought in most cases some weeks ago. Specifications are of good volume, but structural mills are still not swamped on some sizes. We continue to quote 1.60c, Pittsburg, for beams, channels and angles; for tank plates, 1.60c, Pittsburg. Sheets are firm at 3.25c for No. 27 and 3.35c for No. 28, one pass through cold rolls, and all the mills producers can muster are active.

OLD MATERIAL.—Little is doing. Concessions could no doubt be had on some classes of material. We quote f. o. b. Cleveland for gross tons: Old iron rails, $19 to $19.50; old steel rails, 6 feet and over, $16 to $16.50; under 6 feet, $15 to $16; iron axles, $22 to $23; old car wheels, $17 to $18; No. 1 railroad wrought, $16.50 to $17; wrought turnings, $10 to $10.50; wrought borings, $9 to $9.50; cast borings, $5.50 to $6; No. 1 machinery cast scrap, $14.50 to $15; mill scrap, $14.50 to $15; grate bars, $8 to $9; stove plate, $9.50.

CINCINNATI.

May 6.

Referring to the pig iron trade of the past week Rogers, Brown & Co. say: "The bulk of the business has consisted during the past week of small and medium sized orders for early delivery, although there have been interspersed a few transactions involving considerable quantities. There are at the end of the week some heavy inquiries for lower grades of southern iron. The buyers claim that they are not obliged to pay in this district delivered prices based on the so-called Birmingham schedule. The question has been frequently asked why it is that quotations delivered at Cincinnati do not always represent the prices that furnaces located in Birmingham district are asking plus the freight rate from Birmingham to Cincinnati. The explanation is that in addition to the furnaces owned by the companies located nearer this city, some of the Birmingham companies have furnaces enjoying freight differentials to this district, and where competition is close they also make concessions on such brands. Consumption is holding up well and iron is being pushed forward rapidly. An inquiry for spot Bessemer has shown that the market is almost entirely bare of it, and the holders are asking fancy prices in consequence. A marked feature of the situation is the scarcity of labor. This holds good in general among the foundries and furnaces, and will serve in a degree to prevent over-production."

The quotations below are a revision of those previously given and reflect the current irregularities in prices: Southern coke, No. 1 foundry, $14.75 to $15.25; No. 2 foundry, $14.25 to $14.50; No. 3 foundry, $13.75 to $14.25; No. 4 foundry, $13 to $13.50; gray forge, $12.75 to $13; No. 1 soft, $14.75 to $15.25; No. 2, $14.25 to $14.50; Lake Superior coke, No. 1, $15.50 to $15.75; No. 2, $15 to $15.25; Hanging Rock charcoal, No. 1, $20 to $21; Jackson Co. silvery, No. 1, $16 to $16.50; Standard Southern car wheel, $18.25 to $18.75; Lake Superior charcoal, $18.50 to $19.50.

PHILADELPHIA.

May 7

PIG IRON.—Sales during the past week have been the smallest in volume since the beginning of the year. The purchases made during that period were large enough to meet nearly all requirements for the first half of the year and until the relation of supply to demand is definitely known there is every likelihood of a general holding off. There have been several inquiries for basic iron, cast in chills, but there is so little of this grade on the market that it is very difficult to arrange deliveries to suit the buyer. Prices are very nearly unchanged and for the city about as follows: No. 1 X foundry, $16 to $16.25; No. 2 X foundry, $15.25 to $15.75; No. 2 plain, $14.75 to $15; standard gray forge, $14.25 to $14.50; ordinary gray forge, $14; basic (chilled), $14.25 to $14.50, furnace; standard Bessemer, $15 to $15.25, furnace.

FINISHED MATERIAL.—This is brightest spot in the trade, the plate market keeping up remarkably well. Options on some large lots have been taken during the week which it is confidently expected will develop into actual business during the season. Structural material being sensitive to anything affecting plate this industry is also in excellent condition.

The bar trade is not considered as active as it was a month ago, but there is plenty of business offered, enough at least to keep the mills going to their full capacity. Very favorable reports come from the West regarding the bar trade and if these conditions can be maintained in that territory Eastern mills should have no trouble in holding their own. Prices are about as last week's quotations, viz.: Plates, one-quarter inch and thicker, 1.80c to 1.85c; iron bars, 1.50c to 1.55c; steel bars, 1.62½c to 1.70c; angles, 1.75c to 1.85c; beams and channels, 1.75c to 1.85c.

OLD MATERIAL.—The market for old material is stagnant and unless buyers are in need of some particular article it is difficult to effect a sale without granting sharp concessions. As in pig iron the general tone is one of indifference more than anything else and all appear to be waiting for developments. Bids and offers are about as follows in buyers' yards: Choice railroad scrap, $19 to $20; No. 1 yard scrap, $14 to $15; No. 2 light scrap, $13 to $14; machinery cast, $14.25 to $14.75; heavy steel scrap, $16.75 to $17; old iron rails, $19 to $20; old steel rails, $16.75 to $17.25; wrought turnings, $11.75 to $12.50; cast borings, $8.50 to $8.75; old car wheels, $17 to $18; old iron axles, $22 to $23.

BIRMINGHAM, ALA.

May 6

The local iron market continues rather slow though there is no evidence of any weakening in prices. Furnace operators state that a few sales are being made every week, but that they amount to considerably less than the make of the furnaces. The average price of iron sold by the Sloss-Sheffield Steel & Iron Co. in April was over $11, and on that basis the coal miners employed by that company are receiving 55 cents a ton, the maximum under the present contract for digging coal. The Tennessee Coal, Iron & Railroad Co. did not receive as

much for iron sold, according to the report of the committee of miners that investigated its sales books, and the price to be paid for digging coal by that company's employes remains at 52½ cents a ton.

An effort is being made to reorganize the Woodstock Iron Co. at Anniston and it is probable that the promoters will be successful this time. W. S. Gurnee of New York has recently sold his interest in the company and all of the claims against it have been purchased by those who are to control it under the reorganization. The Woodstock Iron Co. owns two coke furnaces at Anniston and several thousand acres of red and brown hematite iron ore lands in Calhoun and adjoining counties.

Heavy Pressure on Sheet Mills.

(Special Telegram.)

PITTSBURG, May 8.—In the past few days, inquiries for more than 2,000 tons of sheets practically went begging owing to the inability of both independent and combine producers to make immediate deliveries. One inquiry was for 1,400 tons of black sheets, 22 gauge, from California, for the construction of a water flume. Another was from Manila, Philippine Islands, for 400 tons of galvanized sheets. Yet another inquiry received today by sheet manufacturers was for 500 tons. None of these inquiries could be promised within less than 60 days. The capacity of Zug & Co.'s mill located here will be increased nearly 50 per cent, about May 15, when two new hot mills and one new cold mill will be placed in operation. The mill now contains six hot mills and three cold mills and the capacity of the new mills in operation will be about 16,000 tons a year.

Open Hearth Plant for Inland Steel Co.

(*Special Telegram.*)

CHICAGO, May 8.—The Inland Steel Co. of Chicago, has increased its capital stock from $260,000 to $1,500,000 for the purpose of erecting an open-hearth steel works, to manufacture billets and merchant bars. The plant will be located on the lake front near South Chicago to secure the advantages of water transportation and will have a capacity of 125,000 to 150,000 tons annually. It is expected the plant, which will include four 50-ton furnaces, blooming mill, billet mill and finishing mills will be in operation by the end of the present year. Work on its erection will be commenced as soon as the exact site has been decided on. The company will continue in operation its works at Chicago Heights where steel for agricultural implements and bedsteads is manufactured.

Jones & Laughlins, Limited.

The fourth furnace of the Eliza group of furnaces of Jones & Laughlins, Ltd., located at Pittsburg, was put into blast this week. When this furnace is operating at its greatest capacity the output of this group of furnaces will be about 2,800 tons daily. When the Carrie plant of the Carnegie Steel Co. is completed its output will equal that of the Eliza group and these two groups will represent the height of furnace building up to the present time. Of the new furnaces of the Eliza group one recently had a run of 625 tons in one day and before many weeks this output will reach 700 tons. With this furnace plant operating in full Jones & Laughlins, Ltd., will be entirely independent of the pig iron market. Their steel producing capacity about equals their present blast furnace capacity. In addition this concern has recently made itself independent so far as ore supply is concerned and together with its own coal mines and coke ovens is not dependent on the market for any portion of its raw material.

The rod mill which has been under construction at the South Side plant for nearly six months will be placed in operation in about two weeks. The daily output is estimated at about 350 tons. The beam mill recently completed and now in operation has a daily capacity of about 450 tons. By the addition of these finishing mills Jones & Laughlins will have little or no steel to sell in the form of billets.

The machinists, boilermakers and blacksmiths employed by the Delaware, Lackawanna & Western Railroad at Scranton, Pa., went on a strike this week. The strike was declared owing to the refusal of the company to grant the machinists a 9-hour day.

REORGANIZATION OF STEEL COMPANIES.

During the past week there were several reorganizations of the constituent combinations of the United States Steel Corporation. Last week the American Steel & Wire Co. reorganized with the election of the following directors: E. H. Gary, C. M. Schwab, J. S. Keefe, Frank Baackes, C. S. Miller, William Edenborn, Alfred Clifford, W. P. Palmer and Dr. L. D. Ward. With the exception of the last four all the directors resigned. Accompanying the resignation of John W. Gates as chairman and director were those of John A. Drake, Isaac L. Ellwood, Randall Morgan, P. A. B. Widener, Thomas Dolan, Stewart H. Chisholm, Thomas F. Ryan, Philip W. Moen, James Hopkins and H. Clay Pierce.

President C. S. Guthrie of the American Steel Hoop Co. tendered his resignation last week and Frank L. Clark, manager of the operating department also resigned. Other changes are looked for at a meeting to be held within the next ten days.

As forecast in these columns last week, at a meeting of the stockholders of the National Tube Co. held this week the board of directors was reduced from 23 to 9. The following actively engaged men were chosen directors: President, F. J. Hearne; E. C. Converse, member executive committee United States Steel Corporation; William N. Cromwell and William J. Curtis, general counsel for the tube combine; Charles Steele, representing J. Pierpont Morgan & Co.; Wm. B. Schiller, first vice-president; Wm. H. Latshaw, second vice-president; J. D. Culbertson, third vice-president; A. S. Matheson, fourth vice-president. All the officers have been in Pittsburg for a month except Treasurer Culbertson, who will soon remove from New York. The following directors retire: Henry Aird, Robert Bacon, J. R. DeLamar, John Don, John Eaton, William S. Eaton, William P. Hamilton, A. F. Luke, Daniel O'Day, Francis L. Potts, Joshua Rhodes, William B. Rhodes, F. R. Tobey and J. N. Vance.

There is also to be a reorganization of the American Bridge Co. The following circular was sent out last week: "The stock of the American Bridge Co. having been acquired by the United States Steel Corporation, it has been deemed advisable to change the executive organization of the former company, so as to more closely comply with conditions as they will exist from now on. To this end the president and vice-presidents have tendered their resignations, and a reorganization of the executive staff and board of directors will take place at the next regular meeting of the board of directors, on May 16."

The resigning officials are: President Percival Roberts and Vice-Presidents C. M. Jarvis, Charles McDonald, William H. McCord, Frank Conger, C. C. Schneider and James Christie. The new officials to be elected at the coming meeting of the board of directors, are: President, A. J. Major; vice-president, in charge of the finances, Mr. McCord; vice-president, in charge of contracts, J. A. Hatfield; chief engineer, C. C. Schneider; mechanical engineer, James Christie. There has also been slated a new board of directors, as follows: A. J. Major, Augustus Ziesing, James A. Huston, C. C. Schneider, James Christie, Paul L. Wolfel, Robert J. Davis, Abram S. Hewitt and Percival Roberts. C. W. Bryan, who has charge of contracts in the Pittsburg district, will remove to New York. James A. Huston, a member of the new directorate, will have his office in Pittsburg. Mr. Huston was president of the Toledo Bridge Co.

The plant of the American Saw Works at Trenton, N. J., was sold last week to John A. Roebling's Sons Co. It is altogether probable that it will be converted into a wire drawing plant and the patents purchased will be disposed of to the best advantage. The drop forging department of the American Saw Works will be continued by the new purchasers.

The open-hearth department of the Sharon Steel Co. at Sharon, Pa., was placed in operation last week and within the week the tin plate department, half of which is now completed, will be started. The output of tin plates will be about 750,000 boxes a year. This entire output has been purchased by the American Tin Plate Co. for five years.

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CONSOLIDATION QUESTIONS.

Six articles grouped under the title "Industrial and Railroad Consolidations" are a feature of the *North American Review* for May. Russell Sage, whose long experience and accumulated millions give a certain weight to his views, albeit his 85 years do not guarantee an adequate appreciation of late developments, writes of the consolidations as "A Grave Danger to the Community," James J. Hill, Chas. M. Schwab, Chas. R. Flint, F. B. Thurber and James Logan, representing conspicuous success in high industry and finance, and with achievements that are rather promises of greater things than monuments to work completed, marshal the arguments in favor of the consolidation as the highest form of industrial organization. Certainly the last word has not been written upon the advantages and disadvantages of combination.

It might seem strange, at first thought, that what is put forth by its advocates as the greatest invention of latter-day thinking upon economic and industrial science, should be so strenuously opposed as worse than the old way—worse than the evils of destructive competition for which it is offered as a cure. One of Mr. Sage's opponents, indeed, expresses surprise that one writing from the standpoint of a financier and man of large affairs and therefore, unlike many who swell the public clamor against trusts, acquainted with their real workings and with the conditions they displace, should go upon the presumption that the consolidations are essentially a menace to the consuming public. The tenor of all the five articles in defense of the consolidation, on the question of consumers' benefits, is that where the combination has been effected with the idea of increasing the cost to the buyer it has failed and was bound to fail. In its treatment of this and other phases of the question—particularly the wastefulness of competition, the cost of which with all its wreckage must be paid eventually by the consumer—this series of articles is probably the ablest yet published on the trust side.

But we do not purpose to go into the discussion, for much of it covers well-known ground; rather, to point to a familiar fallacy, which Mr. Sage's argument contains, and to call attention to the utterances of Mr. Schwab as indicating what the steel trade is to expect of the United States Steel Corporation.

Mr. Sage lays stress, as others have, on the increase of capitalization always accompanying consolidation. He cites as an example a factory, counted a safe investment, and worth $50,000. It falls into the hands of the consolidators and tomorrow becomes worth $150,000—on paper. And whereas the man owning the factory couldn't borrow $10,000 on it yesterday, he now expects—and bankers encourage the expectation—to borrow $60,000 or $70,000 on his $150,000 in stocks. The deduction naturally made from this illustration is that capitalizations going beyond the investment basis are fictitious and unsafe. As a matter of fact investment is but a single factor in determining the value of a company's stock, and not the chief factor, either. It is often said, as though the statement were convincing, that the amount for which a given plant could be replaced is a fair measure of the value of the stock issue of the company owning it. Apply this test to the Carnegie Steel Co. before it entered the United States Steel Corporation. How far would the earnings of, say, two years like last year come from replacing the blast furnaces, steel works, vessels, railroads, and other visible property, leaving out the minerals in the ground, which it would be next to impossible to replace? And going back to first cost, which is Mr Sage's standard, who would undertake to duplicate the Carnegie iron ore and coal properties today for a tithe of the original outlay?

Reversing the proposition, is there anything more familiar in business than the depreciation of industrial property to a mere fraction of the original cost because competition has sprung up and given a producing capacity far in excess of the demand for product? And if competition, or industrial warfare, can thus take away value, is it difficult to see how the cessation of hostilities can make sudden additions to the value of the same property? Taking the steel trade for illustration again: If the expected entrance of the Carnegie Steel Co. upon the manufacture of wrought pipe and sheets and of other companies upon the manufacture of structural steel made the securities of those companies decline in price, is there anything particularly "magical," to use Mr. Sage's word, about the appreciation of the same stocks when it became known that a consolidation removed the menace of superfluous plant?

Earning capacity is certainly a foremost criterion of value. And it is easily conceivable that Mr. Sage's suppositious manufacturer could get five or six or seven times the loan on his securities when their earning power had been increased from zero, let us say, to from 6 to 20 per cent by making peace with warring competitors. Who would leave out organization, management, years of satisfactory relations with a growing trade, and other invisible assets, in estimating the market value of a business? And the jump from a value of $50,000 to $150,000, which Mr. Sage attributes to the fiat of a company of men, is not merely the say-so of a circle of combining manufacturers; it is rather the fiat of a combination of forces whose power to build up is only paralleled by the power of competition, waste, panic and all the demoralizations of individual operation, on the side of loss and disintegration.

That the estimates of promoters go far astray, and that credulous investors are often deceived thereby, is too common an experience for any blinking the facts about some capitalizations. But such excesses do not justify an indiscriminate classification of "trusts." These are good and bad, just as competitive industries are strong and weak, well managed or hastening to a receivership. It is as illogical and undiscriminating to say that consolidation cannot add value to the combined properties as to say that the iron mines of Lake Superior have no more value under a 20,000,000-ton consumption per annum than under the conditions of 1893-95, when the Mesabi range was an incubus on the iron trade, and mines with uncounted millions of tons went begging on the market.

No doubt the new conditions have made the estimation of values in consolidated industrials a matter of much uncertainty. The readjustments have come

swiftly and the precedents of years under the competitive regime are worth little. Nothing is plainer than that the old yard sticks must be thrown away and that new standards must be applied to the new quantities.

More immediately interesting to the iron trade than Mr. Sage's contention for the traditions, is President Schwab's contribution to the symposium. Apart from his general discussion of the application of consolidation to the iron and steel industry, several statements are significant as pointing to a policy. For example, he points out that "a combination, like an individual concern, can only hold its trade provided it gives the best goods at the lowest market price consistent with a reasonable profit." And again: "No matter how great an industry may be, it cannot possibly hope to monopolize the trade in its line, unless it controls some peculiar process or patent. . . . Wise business men realize that a successful trade is an expanding trade, and that an expanding trade can only be had by steadily making concessions to the consumer, where the conditions of the trade warrant. . . . A monopoly in the iron and steel business is an impossibility. No man or set of men could possibly bring such a thing about. No rational person would dream of attempting it. A monopoly of the wheat fields of Minnesota and the Dakotas, or of the fruit groves of California, would be simple by comparison."

On its face such a platform is not menacing to the consumer of steel products, nor to the manufacturer who operates in competition with the big company. One year hence there will be better data for judging how far the big corporation has made the wisdom of its president its rule of conduct.

Suit Against Zanesville Tube Works Promoters.

The National Tube Co. commenced suit this week against the Eastern Tube Co., C. E. Corbett, Harry Nuttall, Joshua Nuttall and W. J. Early & Sons, Ltd., in the Pittsburg courts, in which sensational allegations are made against the defendants. The papers filed in the case assert that among other plants owned and operated by the plaintiff is the mill on Second Ave., Pittsburg, together with its machinery, tools, patterns and trade marks; that in the construction and operation of such a plant it is necessary to have wooden patterns for the casting of various parts of the machinery used for the manufacture of tubes and pipes, such as the welding rolls, housings, troughs, cross roll housings, sprocket and sheave wheels, skelp boxes, and various other pieces of machinery used in the manufacture of tubes and pipes. It is further claimed that each manufacturer of tubes and pipes acquires such patterns different from the patterns used by others as the skill and experience of the particular manufacturer dictates such design, and that the castings made therefrom are held and regarded by each owner as a trade secret not to be imparted to rivals or competitors in business, and the employes of such establishments charged with the custody, management and use of such patterns and machinery made therefrom, by the custom and course of the business and by the terms of the employment, assume the duty of keeping secret the particular designs used by the employer.

The gist of the charge against the defendants is that Harry Nuttall, general superintendent of the Pennsylvania Tube Works plant; Joseph Nuttall, his brother, an employe at the same plant, part of the time in charge of the pattern wing, and C. E. Corbett, manager of the Eastern Tube Co., now building a wrought pipe plant at Zanesville, O., and W. J. Early & Sons, entered into an arrangement by which patterns were taken from the Pennsylvania Tube Works at night to the foundry of Early & Sons and castings made from them for the Eastern Tube Co. It is alleged that from Jan. 1 until his discharge on April 3, Harry Nuttall was in the employ of both companies.

The plaintiff says that it cannot state what particular patterns were used, but among them were patterns for machinery for two, three, four, five and six-inch pipe; housings for rolls, troughs for housings for cross rolls, etc. Some of the castings, it is said, weigh at least nine tons, and have been shipped for use in the Zanesville works. The court is asked to grant an injunction restraining defendants from using any of the castings and that Harry Nuttall, Corbett and the Eastern Tube Co. be restrained from using them and be ordered forthwith to destroy all the castings now in their possession, and that each of the defendants be enjoined in using any of them in any way pending the termination of the suit. A prayer for discovery is also attached to the bill.

ORE STOCKS ON LAKE ERIE DOCKS MAY 1.

Stocks of iron ore on Lake Erie docks on May 1 were larger than usual, the amount being exceeded only twice in the past 10 years—in 1897 and 1898. The total was 3,050,183 tons, against 1,720,656 tons in 1900 and 2,073,254 in 1899. The following table shows the stocks on dock on May 1, 1899, 1900 and 1901 by ports, with the amount on the same docks on Dec. 1, 1898, 1899 and 1900:

Ports.	CLOSE OF NAVIGATION.			OPENING OF NAVIGATION.		
	Dec. 1, 1898.	Dec. 1, 1899.	Dec. 1, 1900.	May 1, 1899.	May 1, 1900.	May 1, 1901.
Toledo	146,568	186,422	242,375	22,915	52 6 6	138,457
Sandusky	48 500	23,184	95 111	7,086	4,300	63,148
Huron	139,982	164,480	211,377	82 r55	48,412	135,143
Lorain	324,034	337,822	251,838	168,646	126,213	140,362
Cleveland	1,175,970	1,200,806	1,337,445	472,916	386,291	8.6,119
Fairport	7-9,794	692,147	611,717	289,417	282,298	306,7 6
Ashtabula	1,732,671	1,902,598	1,8 1,459	855,691	678,769	1,046,974
Conneaut	288,101	468,808	632,514	6,115	8,649	69,735
Erie	439,167	361,335	480,734	95,626	97,894	725,412
Buffalo	121,720	192,681	232,100	72,757	35,195	118,007
Total	5,136,407	5,530,283	5,904,670	2,073,254	1,720,656	3,050,183

The total rail shipments from Lake Erie ports to furnaces in the winter of 1900-1901 appear by comparing dock stocks Dec. 1, 1900, and May 1, 1901:

	Gross Tons.
On dock at Lake Erie ports, Dec. 1, 1900	5,904,670
On dock May 1, 1901	3,050,183
By rail to furnaces in the wint r of 1900-1.	2,854,487

The shipments to furnaces in the seven months from May 1 to Dec. 1, 1900, together with the consumption by furnaces at Tonawanda, Buffalo, Cleveland and Lorain, receiving ore direct in their own yards, amounted to 11,613,773 tons. Adding this to the shipments of the past winter—2,854,487 tons, as above—gives a total for the year ending May 1, 1901, of 14,468,260 tons. These 12-months' shipments for the past eight years have been as follows:

Year Ending—	Gross tons.	Year Ending—	Gross tons.
May 1, 1901	14,468,260	May 1, 1897	6,719,633
May 1, 1900	15,574,785	May 1, 1896	8,805,510
May 1, 1899	12,122,982	May 1, 1895	6,397,215
May 1, 1898	10,209,488	May 1, 1894	4 840,488

The statement of winter shipments for 12 years is as follows in gross tons:

1900-1	2,854,487	1896-7	1,698,467	1892-3	2,053,654
1899-1900	3 8 9,637	1895-6	2,466,014	1891-2	1,971,301
1898-9	3,063,153	1894-5	2,191,267	1890-1	1,231,264
1897-8	2,755,840	893-4	1,482,340	1889-90	1,770,878

For comparison we give below the record of iron ore stocks on docks at the opening of navigation back to 1892:

Year.	Gross tons	Year.	Gross tons.
1901	3,050,183	1896	1,949,698
1900	1,720,656	1895	2,642,980
1899	2,073,254	1894	2,588 370
1898	3,167,915	1893	2,095.797
1897	3,256,497	1892	1,537,188

New Tin Plate Plant at Canton, O.

(Special Telegram.)

PITTSBURG, May 8.—The Canton, O., board of trade contracted this week with J. C. Carnahan, of Pittsburg, representing the Carnahan Tin Plate Co., for the erection of a six-mill tin plant at Canton, O. E. E. Erikson, of Pittsburg, is the engineer. The plant will contain four hot mills and two cold mills. The steel will be supplied by two 30-ton open-hearth furnaces. In addition there will be a breaking-down mill for 6x6-in. billets. This open-hearth plant will also furnish steel to the Stark Rolling Mill Co., which will erect a four-mill sheet plant at Canton. The main building of the tin plate plant will be of steel and will be 314x115 feet. The American Bridge Co. has been awarded the contract for the erection of the building. The mill will be placed in operation in December.

PERSONAL.

Emil Swensson, formerly chief engineer and general manager of the Keystone Bridge Works of the American Bridge Co., has prepared preliminary and suggestive plans for the Carnegie technical school to be built in Pittsburg. They provide for six brick buildings arranged about a court, and to be three stories high. The entire plan is based on a course of instruction to extend over a period of nine years. The first four years are to be devoted to preparatory work and will take the place of the academy and high school, while four years more will be spent on work similar to a college course. The ninth year is devoted to a post-graduate course.

Wm. H. Johnston, secretary and treasurer of the Girard (O.) Boiler & Mfg. Co., has resigned to accept a position with the Republic Iron & Steel Co. at its Andrews works, at Haselton, O.

Jules Siegfried, formerly French minister of Commerce, and his son Andre, a Paris journalist, were entertained this week by the industrial committee of the Cleveland Chamber of Commerce. The plants of the Cleveland City Forge & Iron Co., Brown Hoisting Machinery Co., Cleveland Hardware Co., Cleveland Twist Drill Co. and the Sherwin-Williams Co. were visited. At the plants of the last three companies the shop improvement features in operation for the past two years were inspected with interest.

James Gayley, vice-president of the United States Steel Corporation, has appointed David G. Kerr, of the Carnegie Steel Co., head of the ore department of the United States Steel Corporation for the Pittsburg district.

John Mackin, assistant superintendent of the Struthers Furnace at Struthers, O., before leaving for a six weeks' tour of Ireland last week was presented with a gold watch and chain by the men employed at the furnace.

William T. Jones, retiring master mechanic of the Edgar Thomson works of the Carnegie Steel Co., was remembered by the men at the mill with a silver manicure set. Mr. Jones has been appointed master mechanic of the plants of the Dominion Iron & Steel Co. in Nova Scotia, Can. He left for Sydney last week.

Taylor Alderdice, retiring manager of the McKeesport plant of the National Tube Co., was presented last week with a diamond studded watch from the office force and the men in the tube department.

Kotaro Sakurai, of Tokyo, Japan, arrived in Pittsburg last week from New York. He is an engineer in the Japanese Imperial Navy and will inspect the structural steel manufactured by the Carnegie Steel Co. for the two imperial palaces to be built in Japan.

S. H. Bush of Milwaukee, Wis., has been appointed general manager of the Buckeye Iron Works at Columbus, O.

On Tuesday evening, April 30, Jones & Laughlins, Ltd., of Pittsburg, entertained their sales agents at an informal banquet at the Pittsburg Club, Pittsburg. The following out of town agents were present: H. F. Holloway, New York, N. Y.; G. P. Bullard, Boston, Mass.; J. B. Newkirk, Philadelphia, Pa.; W. F. Bonnell, F. A. Pope, Cleveland, O.; F. A. Goodrich, Detroit, Mich.; Albert Waycott, St. Louis, Mo.; Geo. Kinsey, Cincinnati, O.; G. C. Beals, of Buffalo, N. Y., and D. N. Barker, of Chicago, Ill., were unable to attend. The following officials and heads of departments of the Pittsburg office were also present: B. F. Jones, Jr., W. L. King, W. C. Moreland, G. W. Laughlin, T. K. Laughlin, Roland Gerry, Theo. Stengl, A. F. Adam, J. L. Haines, Robert Geddis, W. G. Miller, T. S. Trumbull; A. H. Holliday, Thomas Anderson, F. S. Slocum, F. M. Campbell, J. B. Laughlin, F. A. Ogden and F. L. Garlinghouse.

It is expected that President Schwab, of the United States Steel Corporation, and Willis L. King, of Jones & Laughlins, Ltd., will testify before the Industrial Commission at Washington next week.

Notice has been sent out of the following official changes in the Minnesota Iron Co., effective April 27: C. P. Coffin is elected president of the company, to succeed J. L. Greatsinger, resigned; Nelson P. Hulst is elected vice-president, to succeed Henry Seibert, resigned; W. W. Watson, Jr., is elected treasurer, to succeed C. P. Coffin, resigned.

ACQUISITION OF ATIKOKAN IRON MINES.

Announcement will be made in a few days, in all probability, of the completion of negotiations for the purchase of the Atikokan iron deposits, lying along the river of that name north of Minnesota in Algoma. These ores outcrop for several miles in a high ridge and are continuous for a long distance. Explorations made the past six months by the American Mining Co., which has had an option at $500,000, have shown the surface promises of the deposits to be maintained for a depth of some 200 feet at least, which proves the ore lenses for a depth of 300 feet from the outcrop which is on a bluff. Analysis after analysis has shown iron 66 and better, phosphorus .020 and under. There has been fear of sulphur, but the recent borings disprove this, it is stated. By a tunnel and 1,800 feet of borings, done the past winter, several million tons have been shown up. The mine will be opened this year and will ship via the Canada Pacific Railroad to Fort William, where docks must be erected.

The largest steam shovel ever taken into the lake mining field has been delivered at the Stevenson, a new mine west of Hibbing, Mesabi range. It is of steel frame and weighs 105 tons. It was built by the Marion Steam Shovel Co., Marion, O. This mine has about 75,000 tons of stocked ore from a shaft and will have its open pit in use in July.

The Sharon mine of the Sharon Steel Co., which is being opened for a milling proposition, will be ready for shipments in July or August. It has a pit 250 by 350 feet to within 15 feet of the ore. Much of the stripping has been in quicksand and delay has resulted. The mine will ship very heavily from the start.

A new mine is being got ready for shipments in the Michipicoten district, the Josephine belonging to the Clergue syndicate. It is 25 miles from Lake Superior and the railroad will reach it soon. Its ore is probably a bit better than that of the Helen mine.

Increased Furnace Capacity for U. S. Steel.

A third furnace, which has been under construction by the National Steel Co. at Mingo Junction, O., for more than a year past, was put into blast last week. Its capacity will be about 600 tons daily and it is now operating on Bessemer. The other two furnaces at this plant were recently remodeled and their output considerably increased. The blowing in of this furnace further increases the pig iron output of the United States Steel Corporation, and the furnace of the American Steel & Wire Co. on Neville Island, below Pittsburg, in the Ohio river to be put into blast in about a month will increase the pig iron output of the company further by about 700 tons daily.

The two furnaces of the Carrie group of the Carnegie Steel Co. at Rankin, Pa., which are now being rebuilt will be ready to go into blast in about six months. With these two furnaces, and the other two above mentioned the daily pig iron output of the United States Steel Corporation will be increased 2,500 tons or about 800,000 tons a year.

Estimating that under present conditions the United States Steel Corporation is compelled to buy 1,500,000 tons of pig iron in the open market to supply its numerous plants, it can be readily seen that it is fast approaching the point where very little pig iron will have to be purchased in the open market. The amount of pig iron that the company will require from month to month is an uncertain quantity, entirely dependent upon market conditions and the demand for iron and steel products. On the other hand the furnace output will greatly vary from month to month owing to the fact that furnaces are constantly being blown out for relining and accidents may occur any day to put a furnace out of operation for months.

Whether the Neville Island plant will be further enlarged cannot be learned at present, but it is logical to suppose that if any additional furnace capacity is desired the new plants will go up on this island owing to the vast amount of money already expended in making improvements on the site of the one furnace now nearing completion.

Humphreys, Stewart & Co. of Pittsburg, state that they have not sold out or transferred any portion of their business to the Tri-State Coal & Coke Co., or any other company.

A PROGRESSIVE ENGLISH MACHINE SHOP.

BY ROBERT I. CLEGG.

Some years ago the writer had an excellent opportunity to study the methods and product of one of the most progressive of English machine shops; and the present time, when the manufacturing processes are being keenly scrutinized abroad, encourages the recital of some of the more noteworthy features of the establishment in question. The firm of Howard & Bullough is located at Accrington, some 20 miles from Manchester, and manufactures an extensive line of textile machinery. And here may be pointed out a peculiarity of British practice in that the builders of this class of mechanism are among the most versatile and aggressive of English mechanics and are prompt to adopt such tools and machinery as are brought out from time to time. Insular prejudice might prefer that these mechanical aids should be purchased nearer home but in seeking for the best this preference was not always gratified, and in the shops I found grinding machinery from Providence, screw machines from Hartford, wood-working machinery from Cincinnati, and a line of gauges from Philadelphia.

At the time indicated the employes numbered somewhere in the neighborhood of 1,400 and apparently perfectly amicable relations existed between employer and the employed, a condition of affairs that so far as I could learn had continued for many years. The hours of labor were differently arranged from our custom but in the main were similar to the arrangement adopted by other engineering workshops of the same type. On Monday the working hours are from 8 to 12 and 1 to 5:30; Saturday 6 to 8, 8:30 to 12; on the intervening days 6 to 8, 8:30 to 12, 1 to 5:30. The 30 minutes rest from 8 to 8:30 would not allow a lengthy trip for the purpose of supplying any deficiencies in the early breakfast taken prior to 6 a. m., hence the firm provided large ovens and hot-water heaters freely for the general use and between 7 and 8 o'clock helpers from the several departments were delegated to the task of utilizing these means of rendering the repast more palatable.

Each employe was designated by a number and every afternoon was supplied with three brass checks stamped with that number and separately 1, 2 and 3. On entering the works in the morning he will deposit No. 1 at an open window at the entrance; promptly on the hour a whistle sounds and the window is closed, if the workman is tardy he must wait ten minutes when the window is again opened to receive checks and payday he will be "short" the equivalent of 15 minutes. The window is open for five minutes before the time set for commencing work and the beginning and end of the five minute period is marked, respectively, by a long and a short blast of the whistle.

Paying off the men was performed in their own time after 12 Saturday and accounts were brought to the preceding Friday night. The cashier appeared at the time-window with a number of shallow trays having numbered recesses to hold each man's earnings and the men were paid rapidly as they walked past in single file in proper order. As every man was anxious to get away the line was easily marshalled. No argument was permitted to delay the cashier. The time-clerk was assigned to another window to hear grievances and rectify errors.

Whilst the payment of the help was in progress the manager met his foremen in the office. Here, too, came the salesmen and the machinists entrusted with the erection and operation of the machinery sent out from the shops. This meeting served to encourage the exchange of opinion regarding defects, complaints or improvements, and other matters of value to the advancement of the manufactured goods.

Apprenticeship.

The apprenticeship question had gone through a series of varying trials starting from the point where the apprentice is indentured by his "next friend" and is under bonds to labor faithfully a given period, during which duly specified amounts of proper technical instruction are to be imparted by the master. This plan was not always a success and in some cases it seemed best to hold the allegiance of a bright youth by a recognition of his worth; and a certain sum, over the wages usual in his allotted position, was put away weekly until his majority. In addition to this free evening classes were conducted, for his benefit, in subjects pertaining to his trade. This course not only caused a healthy rivalry among the younger employes and strengthened discipline but it freed the firm from the danger of a contract with an apprentice of feeble worth or lack of natural aptitude.

The majority of the buildings are of modern type and fireproof construction, well equipped with elevators for the handling of heavy loads. The elevator wells are surrounded with a three-foot fence of piping on each floor. The guides of the platform are applied to one side only and free access may be had on three of the four sides—an item of no small importance in shipping or delivering loads. Every floor has a telephone and cabinet communicating with the main office where a switchboard links any of the several departments when needed. The foremen have their desks conveniently adjoining the telephone cabinets or booths and each is supplied with a notice board bearing the name of every department. A hole is drilled at the ends of the several lines and the foreman is expected to plug the appropriate cavity before leaving for another branch of the works. Should the department be called up during his absence it is not a difficult matter, as a rule, to put the inquirer in touch with the man he seeeks by means of this record and thereby loss of time may be avoided.

At the desk of the foreman will also be found a case containing the simpler surgical supplies needful in first aid to the injured. There is in England a most commendable organization known as the St. John's Ambulance Association intended to teach the requisite measures to be employed in accident cases prior to the arrival of a physician. It is not the purpose of the association to give instruction in surgery in order that the regular practitioner shall not be called, but rather the furtherance of his task through the application of simple remedies. At least one workman from each department attended a course of lectures at the expense of the firm who also maintained the necessary materials for the work.

English Preferences in Machine Tools.

It is quite possible that the use of stock of a less uniform size and character and of a more refractory nature than the familiar compressed steel has been a serious obstacle to the general employment of the screw machine in England to the same degree as on this side of the Atlantic. Recent developments have somewhat modified this condition and there will doubtless be an increasing field over there for machinery of this type. Circumstances as here intimated would require altogether a different procedure in the production of the special stud and screw work to a very large extent. Down in the blacksmith shop were several multiple presses or frame hammers: these machines are belt driven and contain a row of dies of various sizes to produce stud blanks of round, square, or hexagon section. The smith has a number of rods under way at a time in the forge, and the dies take the place of a hand hammer. When the end of the rod is blanked out to the required shape a disk metal-saw is brought into use and the stud-blank is cut off. Afterwards the blank is centered and turned; often threaded on a machine similar to an ordinary bolt-cutter. There is at any rate one advantage in this method and that consists in the saving in material; though this is not so great as at first glance one might be led to suppose.

Jigs of large dimensions were in many instances provided with the quick-acting cam lever in place of the slower retaining screw, although the latter is the usual choice for heavy duty. The cam lever is common enough for light work and is largely used in the manufacture of small arms and jewelry. In fact the elusive collar button owes its cheapness to the cam-operated dies and jigs. Most designers feel some uncertainty in applying the device where considerable strain or vibration must be met and it is worth noting that the establishment in question had adopted it freely.

As soon as practicable iron patterns were in all cases substituted for wooden ones; all being marked with an easily discerned letter and a number, the former indicating the department and the latter referring to the indices kept by the respective foremen. It has not been the lot of the writer to find a more frequent adoption of the match-plate for both small

as well as large work; with the possible exception of some of the largest manufacturers of hardware. It is expensive certainly; but where the design of the machine has become staple and the demand for castings constant, there would seem every inducement to the introduction of this time- and labor-saving expedient.

Providence, R. I.

COMBUSTION CARBON.

BY S. M. RODGERS.

In the realm of analytical chemistry perhaps no subject has received so much attention from the steel analyst as that of combustion carbon. As a demonstration of the importance of this subject to the metallurgical world, it is only necessary to call attention to the international committees appointed a few years ago for the purpose of devising and selecting the best methods for analyzing steel. The accurate determination of carbon not only requires experience and skillful manipulation, but the apparatus usually employed is an item of considerable expense. The following design is intended to reduce the original cost, as well as the expense of operating, and give just as accurate results as the more costly platinum tube.

Fig. 1 shows a vertical cross-section of a platinum crucible and holder, the latter carrying the copper tubes C which are one-eighth inch bore. The holder is brass, cast in two separate pieces, A and B. The crucible E is two inches deep and one and a half inches wide. H is a ground joint with the outside of the crucible ground into B and the inner side ground into A. F is one of two bolts with thumb screws G and hinged on opposite sides of B. In A there are corresponding notches into which the bolts F are vertically raised. By means of the thumb screws G, A is forced into the crucible E, thus making a perfectly tight joint.

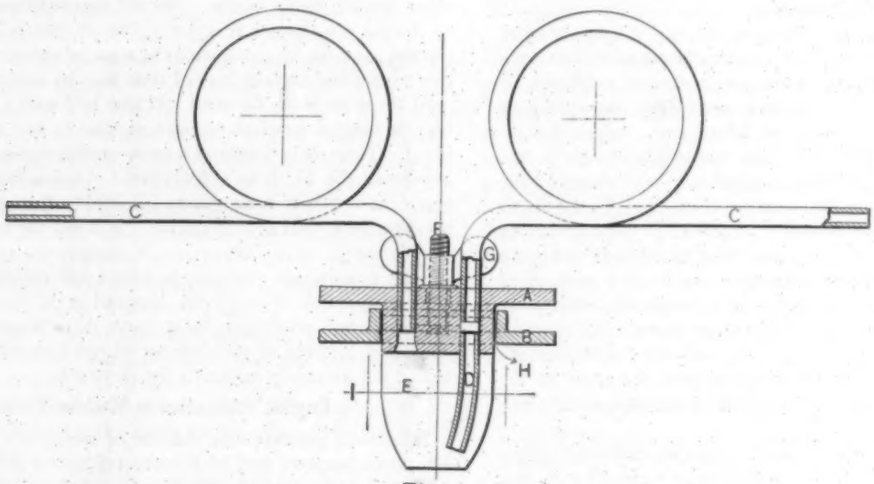


Fig. 1

Fig. 2 shows the apparatus as it appears in practice, only reversed from the usual order. Oxygen or air is passed through A into a concentrated solution of caustic potash in B; thence through C into D; containing solid caustic potash E; through F and G into the platinum crucible containing the carbonaceous residue. S is a roll of asbestos saturated with water to keep the rubber connections cool. K is a Chaddock's burner carrying a piece of asbestos board R with a hole in it just large enough to expose the lower half of the crucible to a strong Bunsen flame. L is a bulb to receive moisture. M is a porcelain tube 12 inches long with ⅜-inch bore and containing copper oxide. N is another Chaddock's burner with a fish tail for spreading the flame along the tube. O and P are two modified Meyer's tubes containing a hot saturated solution of barium hydroxide.

The coils in the copper tubes C in Fig. 1 are designed so as to remove the rubber connections as far from the source of heat as possible, without increasing the space required for the apparatus. By thoroughly saturating the asbestos pads S with water at the beginning of the operation, all danger of vitiating the results from the rubber connections is entirely eliminated. The carbonaceous residue is prepared in the following manner: A porcelain gooch crucible with straight sides and false bottom is tightly packed with ignited asbestos, about one-fourth inch deep, using suction. The closed end of a test tube almost large enough to fill the crucible is then placed upon the asbestos plug in a vertical position, and enough asbestos is poured around it to cover the inside wall of the crucible more than half way to the top. The tube is removed, and the carbonaceous residue is filtered and washed in the usual manner. The crucible is then removed from its holder and by placing the finger beneath the disc the asbestos plug is gently raised, thus freeing it from the sides of the crucible, and making it easy to transfer to the platinum crucible after it has been dried at a temperature of 85° to 90° C for one hour.

The plug is now inverted into the platinum crucible and the porcelain disc removed, and A and B are properly adjusted. No cooling devices of any kind are required, except to moisten the pads S in the manner described above. Check results agreeing within .005 per cent are easily obtained, and the apparatus leaves little to be desired in point of time and convenience.

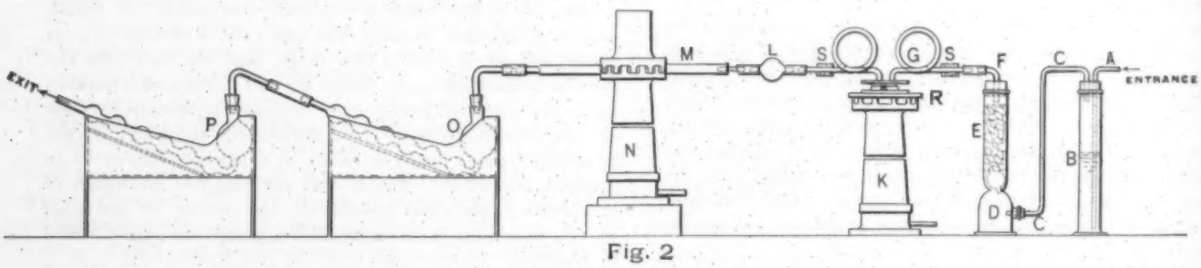


Fig. 2

Laboratory American Steel & Wire Co.,
Cleveland, O.

The plate department of the Valley mill of the Republic Iron & Steel Co. at Youngstown, O., resumed operations last week after an extended idleness. Plates from 28 to 45 inches in width are to be rolled for an order received from the National Tube Co. This material is to be used as skelp and will be iron exclusively.

PITTSBURG FOUNDRYMEN'S ASSOCIATION.

A communication received from Local Union No. 46 of the Iron Molders' Union of North America located at Pittsburg, precipitated an interesting discussion at the regular monthly meeting of the Pittsburg Foundrymen's Association, held in the rooms of the Builders' Exchange, Pittsburg, Wednesday evening, May 1. The communication stated that the molders wished to discuss the apprenticeship question with a committee representing the Pittsburg Foundrymen's Association, but the letter failed to state the phase of the question to be discussed. The presumption was that the molders would endeavor to enforce the 8 to 1 rule, that is one apprentice to every eight molders and where less than eight molders are employed only one apprentice to a shop. This rule is no doubt being violated in Pittsburg foundries, as well as in foundries throughout the country, in view of the inadequate supply of skilled molders. In the Pittsburg district nearly every foundry is working short handed and the local union is unable to supply molders when asked to do so. Despite this condition of affairs it is apparent that the union wants to stir up this question at the present time, whereas the rigid enforcement of the rule would make the foundries more short handed than ever.

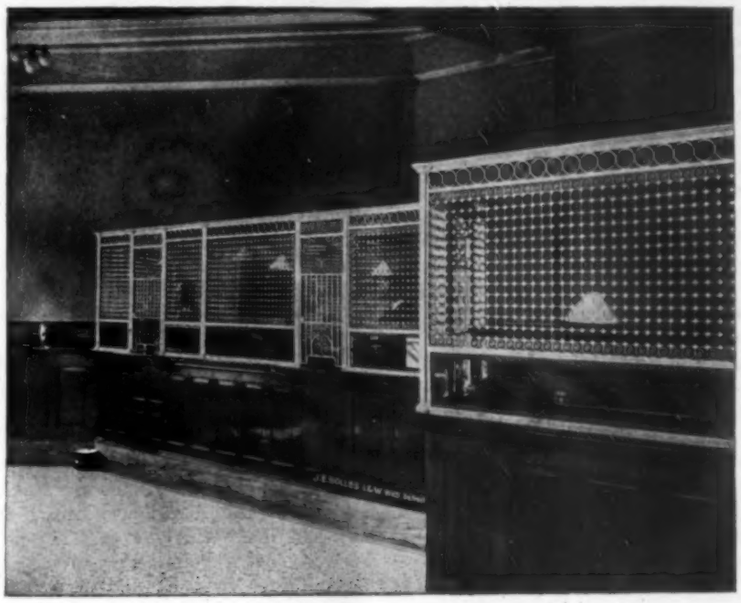
The advisability of the association taking up this matter was the first question raised. Some were of the opinion that it came within the scope of the constitution and that the association had power to treat with he molders if it sought to do so. Others believed that it was a question to be taken up and adjusted by the National Founders' Association and a resolution was adopted suggesting that the local union refer the matter to its national officers for consideration with the National Founders' Association.

It was stated by foundrymen during the discussion of this question that the enforcement of the 8 to 1 rule would mean in time a marked depletion of the craft. The constantly growing demand for molders throughout the country, it was argued, necessitates increase in the number of apprentices and possibly requires a shortening of the term of service. Computed on the 1 to 8 scale, with four years of apprenticeship, the average working life of a molder should be 32 years, to maintain the supply, and this the foundrymen at the meeting believed to be far from the truth. While no figures regarding this interesting phase of the question were at hand some of the foundrymen expressed the opinion that 15 years would be much nearer the average usefulness of a molder at his trade than 32.

The reading of the paper prepared for the evening was dispensed with and the coming convention at Buffalo was discussed. From expressions by those present it is evident that Pittsburg will again be well represented at the convention. It is probable that a Pullman car will be chartered by the association. Secretary Zimmers will notify the members within a few weeks just what arrangements he has made, after learning how many contemplate attendance at the convention. The next meeting of the Pittsburg Association will be held on June 12, as the Buffalo convention interferes with the regular meeting night.

STEEL GRILL WORK.

The J. E. Bolles Iron & Wire Works of Detroit, recently furnished a neat design of steel grill work for the Peninsular Savings Bank, Detroit, at its new Gratiot Ave. branch. The half-tone cut illustrating it is from a photograph of the interior of the bank. The railing, including the bevel plate glass base, is 42 inches high from the counter. The wide panel is what is known as one-quarter twist scroll border work. It is all hand made and produced by skilled workmen. The steel is accurately formed by hand then interwoven, forming lock joints, with a scroll border finish. The railing has a molded top finish, which surmounts a narrow grill panel and gives what the architect, E. C. Van Leyen, of Detroit, sought after—uniformity of design pleasing to the eye and in harmony with the general interior of the bank.



STEEL GRILL WORK.

Announcement has just been made that a partnership has been formed by B. M. Gardner and Charles R. Robinson, under the firm name of Gardner & Robinson, with office at 1522 Monadnock, Chicago, to deal in iron and steel products. Both Mr. Gardner and Mr. Robinson have been in business in Chicago for a number of years. Mr. Robinson was formerly in the sales department of the Chicago office of Singer, Nimick & Co. He has been in the iron and steel business for over ten years, and is well known to the trade. Mr. Gardner has been the Western representative of *The Iron Trade Review* for the past nine years, with office in Chicago, and has a large acquaintance. Gardner & Robinson have secured the sales agencies of the following concerns for Chicago territory: Seaboard Steel Casting Co., of Chester, Pa., manufacturer of open hearth steel castings up to 80,000 lbs.; Acme Steel & Malleable Iron Works, Buffalo, N. Y., manufacturers of "Acme" and "Ductile" steel castings and malleable iron castings; Wallace Machine & Foundry Co., LaFayette, Ind., architectural iron castings; New Brighton Steel Co., New Brighton, Pa., high grade crucible tool steel, bars and sheets, and tool steel forgings. They also handle " motor" metal, for anti-friction purposes.

A COMPARISON OF AMERICAN AND BRITISH ROLLING MILL PRACTICE.*

BY WM. GARRETT.

The condition of the iron and steel trade in Great Britain today is attracting a great deal of attention. She who formerly held the supremacy in the manufacture of iron and steel has not only lost it, but her shores are invaded by foreign material, in particular from the United States and Germany, these countries sending there thousands of tons of raw and finished material, part of which is to be finished and part re-exported to foreign countries.

Great Britain is not only mistress of the seas in times of war, but is also mistress of the seas in times of peace. Her ships are found on every sea, at every shore, in every clime. Her means for reaching foreign countries are unequaled by any, and this combined with her past wonderful resources in fuel and iron ore, and the fact that Great Britain is the home of a Cort, a Bessemer, a Mushet, a Siemens, a Thomas, a Gilchrist, and a Lowthian Bell, (the achievement of every one of whom in their day and generation has made an era in the manufacture of iron and steel), is what gave that country the supremacy. She had: First, the raw material; second, the market, and third, the brains. But in the course of time conditions have changed; and the fact that coal is being sent to Newcastle, as it were, or material is being delivered at the door of those who at one time controlled the manufacture of this material, proves this to be the case. What are the conditions that have changed? Lack of raw material? It appears not, for you are the second largest producer of coal in the world, in 1898 producing 220,085,303 tons. And both Sir Lowthian Bell and Mr. C. Kirchhoff are trying to outvie each other in proving that pig iron can be manufactured in Great Britain as cheaply as anywhere in the United States, taking into consideration the long haul necessary to bring the raw material together for making pig iron in the United States. Sir Lowthian Bell is very skeptical as to the possibility of any foreign country being able to land iron and steel on the British shores in competition with Great Britain, believing the many thousands of miles iron and steel have to be transported are a barrier never to be overcome.

Is it because Great Britain is no longer mistress of the seas, and her foreign markets are not so accessible as in the past? No one for a moment believes that there ever was a time when she was better able to reach any part of the world than at the present time, and new markets are being opened up every day. What does the trouble in China and the Transvaal war mean? In the end, more markets, not only for British products, but for the products of the whole manufacturing world—this through your "open-door" policy. And if it were not a political question, it might be admissible to dwell on this as the one reason why you are losing your supremacy in the manufacture of iron and steel. As it is not because you cannot make your pig iron as cheaply as it is made elsewhere, and not because of the curtailment of your markets, and cannot be because of your ignorance of scientific truths (Sir Lowthian Bell points out with pride your scientific colleges at Newcastle, Leeds, Nottingham, Sheffield, Edinburgh and Glasgow for teaching the sciences of metallurgy)—what then can be the reason that you are underbid in regard to rail contracts for abroad, that tin plate bars are being shipped by thousands of tons right into your tin plate district, that thousands of tons of soft steel billets are delivered to your rod mills and merchant mills, thousands of tons of plates delivered right at the back door of many of your steel plate makers, and skelp and strips for the purpose of making pipe and tube landed next door to your manufacturers of strips? It would seem that all the blame lies with the men who start with the pig iron and put it into the finished material.

Handicaps on American Steel Exports.

But before going into this question, just think for a moment what it means for Pittsburg manufacturers to deliver their product in England and Scotland. It means that they have to ship their material over 3,000 miles by water and nearly 500 miles by land, at the cost of between $5 and $6 per ton, or about 25 shillings; and all things being equal by way of manufacture in both countries, it means that the Pittsburg manufacturer should have to get his ore and coke for nothing in order to be able to do this, so it cannot be all on account of the advantage the manufacturer of the United States has in regard to cheaper raw material. To come to the point, where does this difference in the cost of the manufacture come in, assuming that we are already agreed—and we have it on the best authority—that Great Britain can produce pig iron as cheaply as the United States? During the period of 1893-1896, many thousand tons of Bessemer pig iron were sold for $9, and 4-inch billets could be bought in the open market at that time for $14 a ton, a difference of $5 or 21 shillings per ton. So you must be able to convert pig iron to steel billets for less than that amount, for some steel makers at that time paid a dividend. If not, then there is something wrong with your method of making Bessemer steel ingots and rolling them into billets.

Blooming Mills.

As my remarks are to be confined to rolling mill practice, I will begin my comparison with the blooming or cogging mill. I understand Great Britain to be the birthplace of the Ramsbottom reversing engines and reversing blooming mills. America, in its early history of making Bessemer steel, adopted the three-high system, and no two men have done more to perfect this system than John Fritz and his brother George. Since the advent of the 4-inch billet, which is now so generally used in the United States, the two-high reversing mill has become almost universal, except for rail mill purposes. We simply copied what you had already done and improved on it. The reason why a three-high mill is not considered as well adapted to making 4-inch billets is that when, as is often the case, a 6,000-lb. ingot is used, the piece would be over 125 ft. long when finished to a 4-inch billet, and the lifting tables would have to be very long, in fact, too long to be conveniently handled. So, with the exception with one or two mills which make some other product than billets, all 4-inch billets are made on two-high reversing mills. Logically, no other country should have been before Great Britain in adopting the 4-inch billet as the standard size. But the fact is, that no country is more prejudiced against it. I will endeavor to state why:

All of your blooming mills are attached to finishing mills, upon which you make rails, structural shapes, large merchant bars, and small billets. Owing to this diversity of product from one mill, there is necessarily a great deal of roll changing, and when changing rolls the whole system is stopped up to the making of Bessemer steel—everything standing still, time lost, money lost, and plant non-productive. In some places duplicate finishing mills are used in order to prevent this loss. If your cogging mills are adapted to 4-inch billets as in the United States, and your small merchants and rod mills adapted to take a 4-inch billet, all this loss would be obviated, and the expense of an extra mill would be unnecessary, as you could be making 4-inch billets while changing rolls. For in order to make, say, a 2-inch billet, you must go through nearly all the motions of making a rail, except straightening, drilling, etc., must use the whole train and the same number of men, and a 2-inch billet costs nearly as much as angle bars. You should also be able to make slabs suitable for making light plates, but you roll nothing but blooms suitable for the finished material your finishing mill is adapted for. All that is necessary to make 4-inch billets and slabs, and any size of blooms for rails, etc., is a pair of rolls exactly the same as in general use on a blooming mill in the United States, with the necessary room for shearing and taking care of the billets. That it is desirable to find a market for what sizes you can make on your blooming mill while changing rolls, is evident, seeing that your German competitors have recently adapted themselves to a 5-inch square billet, which they roll at one heat into wire rods. In fact, in some places they take a 6-inch or 7-inch bloom and roll it into rods at the one heat. These blooms are sold at a reduced rate from a 2-inch billet, as they are able to make those sizes on their blooming mill while changing rolls.

This is leakage No. 1, adding to the cost of all material you make on your reversing blooming mills. Next is the time

*Read before the Iron and Steel Institute, London, Eng., May 8, 1901.

lost on account of the irregular way in which you keep your mill filled up with material. In America, the greatest effort is made to find something for the blooming mill to do while changing rolls, and to keep the mill continually full of material. It is an acknowledged fact in regard to American mills, that stoppage from breakages or some unseen cause are considered a misfortune by the management. Time lost through not keeping the mill full is considered a crime, and results in the immediate dismissal of the responsible party. Go to the manager's office in connection with any well established steel plant, and you will see on record a statement of what has been done in every department during every hour of that day, and the cause for every minute of lost time, if any. But it may be said by some that owing to close attention to this point, American mills and engines are better constructed than those in Great Britain to stand this, you may say, undue pressure. I may say here that the blooming mill holding the world's record for the production of 4-inch billets, having produced 1,200 gross tons in 24 hours, at the plant of the Lorain Steel Co., Lorain, O., from an 18-inch by 20-inch ingot weighing 5,500 lbs., is driven by a Galloway engine. And in justice to the English engine builder, I may add that no engines in the United States give better satisfaction than the three Galloway engines at the plant of the Lorain Steel Co.

Rail Mills.

We will now briefly consider your rail mills. Why is it that you do not make a larger tonnage on them? Is it because you do not desire to? If this is the case, I have nothing further to say on that point. However, if the reply is that you cannot find a market for any more tonnage, then I will ask why the American manufacturers ship so many thousand tons of rails to the foreign markets that were once yours, and underbid you to get orders? Why is it that you are making rails in every two-high reversing mill in your country, and in doing that not only losing your orders for rails, but allowing thousands of tons of tin plate bars to come into your tin plate districts. Whereas if you could produce more rails in a given time, you would have more time to make tin plate bars; and if your rail mills are not so well adapted as they ought to be for making rails or tin plate bars, is it not better to remedy the evil than to lose trade? But are you taking out the maximum production from the rail mills you have, and have you the best adapted mills for making tin plate bars? I question both, from what I have seen in this country and the States. Do you keep your rail mill full of steel from 6 in the morning to 6 at night, as they do in the United States, where this is the rule and not the exception? If not, then that is the one reason why you cannot get the same production and manufacture as cheaply. Do you keep two bars in the roughing and two bars in the finishing at the same time? If not, then you differ from the American practice—this, of course, on three-high mills—and this is another reason why your output is not so great. But are your reversing mills adapted so that two bars can be handled in the same pair of rolls at the same time? Perhaps not, but such is the difference in conditions. It is my opinion that you try to roll too many different kinds of shapes and sizes on the one mill, making your reversing mill a "Jack of all trades and master of none." For a jobbing merchant mill, in my opinion, no mill is more suitable than a reversing mill, and when the Lindsay coil clutch gains the full confidence of the steel manufacturer, a reversing mill for rolling large sizes of merchant bars will become more popular than ever. However, in view of what is being done in the United States, we cannot admit that it is the best type of mill for rolling rails.

Tin Plate Bar Mills.

One of the stock arguments of the British iron and steel manufacturer, when his attention is drawn to the large production of the American rolling mills, is as follows: "If we had such large demand for such special material as you have in the United States, we would not hesitate a moment to put in special mills and appliances to handle the material, and produce as much and as cheaply as you do." What about tin plate bars? Prior to the year 1892 few if any tin plates were made in the United States, and yet that country was the largest user of tin plate in the world. For years previous to that time it imported from this country from 300,000 to 350,000 tons of tin plate per annum, and this was but 75 per cent of what Great Britain made. Here we have a demand for about 440,000 tons of tin plate per annum, calling for approximately 550,000 tons of tin plate bars every year. Isn't that a sufficient amount of special material, and enough to induce some one to put up special mills for making tin plate bars? It seems not, for if anything, the mills you make tin plate bars on today (after losing nearly all of that trade) are better than they were when you had almost a monopoly on the manufacture of tin plate for the world. So you must confess that due diligence was not made with a view of taking advantage of the favorable conditions of that time.

What did your American cousins do, with the demand for tin plate bars about 100,000 tons per year less? Why, some of the best, if not the best, machines we have in the United States for the rolling of steel are mills for making tin plate bars, and today they are pushing their tin plate bars in thousand-ton lots right into your tin plate districts.

Among the most noted tin plate bar mills in the United States are those of the following plants: The Duquesne plant of the Carnegie Steel Co., the National tin plate bar mill at Youngstown, O.; the Bellaire Steel Co., Bellaire, O., and the mill at Vandergrift lately owned by the Appollo Sheet Steel Co. (all of which mills many of you have seen). Each of these mills is of a special type, and from the ingot to the finished bar, even to the placing of the latter on the cars, all of the work is done by machinery. The result is that tin plate bars are sold for $1 per ton above (and in some cases less) the cheapest steel product in the country, i. e., a 4-inch billet. It is true that these mills cost a great deal to build, but money is no object to the American manufacturer if he can but see a fair return. I must confess, from my experience and observation, that the British manufacturer is rather conservative on this point. Here you are today with a large tin plate trade, and no effort is being made to prevent foreign competitors shipping tin plate bars right into the country from a distance of 3,500 miles.

Structural Steel Mills.

In regard to structural steel, I will touch but briefly on this subject, as I cannot see such a marked difference in the British and American methods, seeing that the Carnegie Steel Co. rolls all its structural steel on the three-high system, while the Pencoyd Iron Works roll their material partly three-high and partly two-high, and opinion is pretty evenly divided as to which is best and will make the largest tonnage. However, owing to cutting the ingot into two parts, and also the first and last end of the shaped bloom, which must be done on a three-high mill with a positive running engine, and while the cost of labor may be less, the percentage of finished product is greater on a two-high reversing mill, which I understand is the practice in this country and on the Continent. In this case it appears to me about a standoff.

Plate Mills.

It may seem strange to hear an American say that he believes a two-high reversing mill for rolling plates to be better than the three-high mill with the small roll in the middle, but I must frankly confess that such is my opinion—this, bear in mind, for plates 5-19-inch thick and above—and were it not that the reversing engine takes more steam than a positive running engine, I think there is no question of the advantages in favor of a reversing mill. I base my opinion on the following: First, there is no lifting tables required, which are very hard to keep up. Second, if the three-high mill is better adapted to roll thin plates, the reversing mill is better adapted to roll thick plates. Placing a 5- or 10-ton slab on lifting tables necessitates the waste of so much energy in raising and lowering the said slab. Third, a reversing mill is better adapted for having extra sets of finishing rolls, which adds to the life of the rolls and gives a smoother surface to the plates.

But then it may be said, "Look at the enormous output of the American three-high plate mills, some of which have made over 10,000 tons of finished plates in a single month." To that I reply: "Keep a two-high reversing mill as full of material as they do in the States, and your product will be no less—in fact it ought to be greater. Go at any time during the day or night to see a three-high plate mill in operation at

the Homestead Works of the Carnegie Steel Co., where, as regular as the tick of the clock, the slab is placed on the table which carries the same into the rolls—one slab after the other, when the plate is going through the last pass. In fact, the slab has often to be stopped to give time for the rolls to be raised to the proper place to suit the thickness of the same. Do the same thing on some of your modern plate mills in Great Britain and mark the increase in the output. In rolling a plate ⅜-inch or ½-inch thick from a well heated slab on a three-high mill before it gets to the last pass or two, it is generally the custom to wait so as to finish the plate at the required heat, in order to get the necessary tensile strength and a smooth surface. You will observe exactly the same conditions on a first-class two-high reversing mill. If this is so, whence comes the advantage so far as output is concerned? On a three-high mill plates must be finished to such shape as to suit the market. Indeed, I honestly believe that if some energetic American manufacturer ever puts in a two-high reversing mill with two stands of rolls, he will outstrip the present output of the three-high mill, for while the plate is cooling to the required degree on the table of the finishing set of rolls, he will give the next slab two or three passes in the first set; and to say that the British workman cannot be as active and energetic as the American workman, if it is his desire, is entirely wrong. I wish some of my American friends would visit some of your large steel works about a quarter to six, night or morning, or at the change of the turn, and see them hustle to get out all they can before the whistle blows. And again, who are the majority of the iron and steel workers of America today? Europeans, or direct descendants of Europeans, and the majority of them from Great Britain.

[*Concluded in next issue.*]

SIZES OF WIRE CLOTH.

In referring to wire cloth for screening purposes the custom is to state the number of meshes per linear inch, but inasmuch as wire of various diameter is employed in making cloth of a certain number of meshes per linear inch, the character of the cloth cannot be determined unless the number of the wire from which it is woven be specified. It is important to specify the number of the wire because, for example, a 24-mesh screen woven with fine wire may have larger apertures than a 20-mesh screen woven with coarse wire. There used to be a good deal of confusion with respect to wire cloth, owing to the different wire gauges employed by different manufacturers. This difficulty has, however, been happily obviated during the last two years, the Wire Cloth Manufacturers' Association having adopted on March 7th, 1899, the Washburn & Moen, or Worcester, gauge as the standard of all iron or steel wire cloth and the old English gauge as the standard for all brass or copper wire cloth. These gauges are to be found in almost any of the engineers' pocketbooks and from them the diameter of the apertures in a wire cloth of any mesh can be calculated readily if the number of the wire from which it is woven be specified. The mesh in wire cloth is always the number of openings in a linear inch measuring from center to center of wire. A linear inch will comprise, therefore, the same number of apertures and wires. Multiplying the diameter of a single wire in decimals of an inch by the number of wires in a linear inch, subtracting the product from unity and dividing the remainder by the number of meshes per linear inch, will give the diameter of each aperture in decimals of an inch.

Steel wire cloth is made in great variety for all meshes except the finest. No. 1 mesh wire cloth is woven with wire from No. 3 to No. 15; No. ¾ mesh from No. 4 to No. 16; No. ⅝ mesh from No. 5 to No. 17; No. 2 mesh from No. 6 to No. 18; No. 2½ mesh from No. 8 to No. 19; No. 3 mesh from No. 10 to No. 20; No. 3½ mesh from No. 11 to No. 21; No. 4 mesh from No. 11 to No. 22; No. 4½ mesh from No. 12 to No. 23; No. 5 mesh from No. 13 to No. 24; No. 6 mesh from No. 14 to No. 25; No. 7 mesh from No. 15 to No. 26; No. 8 mesh from No. 16 to No. 27; No. 9 mesh from No. 17 to No. 28; No. 10 mesh from No. 18 to No. 29; No. 12 mesh from No. 19 to No. 30; No. 14 mesh from No. 20 to No. 34; No. 16 mesh from No. 21 to No. 35; No. 18 mesh from No. 22 to No. 36; No. 20 mesh from No. 23 to No. 36; No. 22 mesh from No. 24 to No. 36; No. 24 mesh from No. 25 to No. 36; No. 26 mesh from No. 26 to No. 36; No. 28 mesh from No. 27 to No. 36; No. 30 mesh from No. 28 to No. 36; No. 35 mesh from No. 29 to No. 36; No. 40 mesh from No. 31 to No. 37; No. 45 mesh from No. 33 to No. 37; No. 50 mesh from No. 34 to No. 38; No. 55 mesh from No. 35 to No. 38; No. 60 mesh from No. 35 to No. 39; No. 64 and No. 70 mesh from No. 37 to No. 39; No. 74 mesh from No. 39 and No. 40; No. 80 mesh from No. 40 and No. 42; No. 90 mesh from No. 42. The number of the wire and the diameter of the apertures in inches and millimeters of the regular heavy grade iron or steel mining wire cloth are given in the following table:

REGULAR SIZES OF WIRE CLOTH.

(The mesh in wire cloth is the distance from the center to the center of wire.)

Mesh.	Wire No	Diam. of Wire. Inches.	Diam. of Aperture. Inches.	Equivalent in Millimeters.
1	3	.2437	.7563	19.81
¾	4	.2253	.5247	13.33
⅝	5	.2070	.4180	10.62
2	8	.1620	.3380	8.59
2½	9	.1483	.2517	6.39
3	10	.1350	.1983	5.04
3½	11	.1205	.1652	4.20
4	12	.1055	.1445	3.67
4½	13	.0915	.1307	3.32
5	13	.0915	.1085	2.76
6	14	.0800	.0867	2.20
7	15	.0720	.0709	1.80
8	16	.0625	.0625	1.59
9	17	.0540	.0571	1.45
10	18	.0475	.0525	1.33
12	19	.0410	.0423	1.07
14	20	.0348	.0366	.93
16	22	.0286	.0339	.86
18	23	.0258	.0298	.76
20	24	.0230	.0270	.69
22	25	.0204	.0251	.64
24	26	.0181	.0236	.60
30	28	.0162	.0171	.43
40	31	.0132	.0118	.30
50	34	.0104	.0096	.24
60	36	.0090	.0077	.20
64	37	.0085	.0071	.18
70	38	.0080	.0063	.16
74	39	.0075	.0060	.15
80	40	.0070	.0055	.14
90	42	.0062	.0041	.10

A roll of wire cloth is always understood to be 100 linear feet. Any width can be obtained to order. Prices are quoted per square foot.—[Engineering and Mining Journal.

The Coke Industry in Alabama.

The coke industry in Alabama has grown even faster than coal mining. It was not known until in 1876 that the Alabama coals would make good coke, suitable for smelting, and now Alabama ranks third of the States of the Union as a coke-producing State, being surpassed only by Pennsylvania and West Virginia. The coke output of the State for the calendar year 1899 was given by the State mine inspectors at 1,798,612 tons. This coke was used principally within the State for iron-ore smelting, though a considerable portion of it was shipped to other States and to Mexico for smelting and foundry purposes. The present output does not begin to supply the present demand. Many new ovens are being built. The output of 1899 was made in something over 5,000 ovens, all of the beehive pattern with the exception of 120 of the Semet-Solvay. There are 63 Thomas ovens in the State, though they have not been running for several years. The coke is made principally from washed slack, though the entire output of some of the coal mines is crushed, washed, and converted into coke. The washed coke is allowed to drain in bins before coking. The heat and gases from the ovens are allowed to go to waste with the exception of one case besides that of the Semet-Solvay byproduct plant. In that exceptional case, the heat and gases from the ovens are converted into steam to heat boilers, etc. The Semet-Solvay plant is said to deliver to the steel works for its use over a million cubic feet of coke-oven gas daily. The use of the heat and gases from these two plants is a very great saving in steam coal. The plant of 120 Semet-Solvay ovens is now being duplicated. The coke output for 1900 has been estimated at 2,150,000.—[Mines and Minerals for May.

PRESIDENT SCHWAB ON THE STEEL CORPORATION.

The May *North American Review* has a symposium on "Industrial and Railroad Consolidations," contributed to by a number of leaders in industry and finance. President Schwab, of the United States Steel Corporation, writes of "What May Be Expected in the Steel and Iron Industry." Special interest attaches to this article as it is Mr. Schwab's first word of any considerable moment on the prospects and policy of the greatest modern industrial corporations. We make some extracts from the article below which are of particular significance in that they point out that no monopoly in the steel trade is possible or intended:

"The larger the output, the smaller, relatively, is the cost of production. This is a trade axiom. It holds good whether the output consists of pins or locomotives. Where the output is produced by fixed processes the rule applies with especial force. It is much more economical, proportionately, to run three machines under one roof than it is to run one. It is cheaper to run a dozen than it is to run three, and cheaper still to run a hundred. Therefore, the large plant has an undoubted advantage over the small plant, and this advantage increases almost indefinitely as the process of enlargement continues. It is the recognition of this principle that has brought about the era of business consolidation now in full swing in the United States. Of course, there are limits beyond which this cannot be carried. It is possible to conceive of an enterprise so huge that it would be unwieldy, but, thus far, the danger point in this direction is not in sight. . . . One of the most considerable items of cost in manufacture has always been the labor of supervision. This class of labor produces nothing, yet, in a measure, it is the most important division in the industrial scheme. Under the system of concentrated management, this item is considerably diminished. Useless officials are lopped off in all directions, and that without impairing the efficency of the service. On the contrary, the efficiency is increased; for the new system brings a specialist of a high class to do the work that was performed under the old by a dozen or two dozen men who had no special fitness for the work, but who, nevertheless, being generally large stockholders, drew large salaries as president, vice-president and so on. . . .

"No matter how great an industry may be, it cannot possibly hope to monopolize the trade in its line, unless it controls some peculiar process or patent. In that event, there is no need of combination, and the monopoly is no greater, even if a combination is effected, than it was before. The Standard Oil Co., which was one of the pioneers in the scheme of combination, and which undoubtedly stands today as one of the highest types of the possibilities of the scheme, was never at any stage able to effect a monopoly. It has today, and always has had, a very considerable competition. It made hundreds of millions of dollars for its chief stockholders, not because it increased the price of oil, but because it lowered it. That was the only reason why it continued to exist and to flourish, to meet all competition and to overcome it. It gave the consumer more for his money than he had ever received before. . . .

"One of the greatest advantages that will come of the concentration of industries is the development that it will bring to our latent resources. Under the expensive system of individual control, much of our natural wealth remained unavailable, and would have so remained for a long time to come. Where each step in the process of production had to yield a distinct profit to a certain class of men, the margin was not sufficiently large to warrant the exploitation of many fields rich with raw material. A concern that produces its own raw materials and works them up through the various processes until it delivers the manufactured product in the domestic or foreign market, can work on a narrower margin all around, and yet do full justice to its stockholders and employes. Naturally, it can control in the markets and develop its trade, where a concern working under less scientific processes would be shut out.

"The iron business was kept back in this country for many years because there was no connection between the various industries on which it depended. The ore deposits were owned by one set of men. The coal deposits were owned by another set. The coke was made in a hundred different places, scattered throughout several States, under separate management. The mills and furnaces, in turn, were owned separately; and, when these mills and furnaces, having bought their iron here and their coke there, and their other products elsewhere, finally produced their iron and steel, there were still other processes that the product had to go through at other points, before it could finally be landed in the market. Everything was disconnected and disjointed. It was not until the whole process was welded into a continuous chain under one management that the American iron industry began to make the giant strides which have now carried it into a position where it dominates the whole world. . . .

"Now we mine our own iron and our own coal, we make our own coke. We carry these products on our own vessels and on our own railroads to our own furnaces, and then we carry the raw steel and the raw iron to our own mills and other plants to be worked up under our own supervision into final shape for direct use in construction. Nothing is left to chance. Every step of the process is carefully worked out in advance. All waste is cut off. Every hand that is laid on the production pushes it along. Instead of being jerked here and there on side tracks, and paying for the privilege, the material, from its raw state to the finished product, is held under one control. . . . The men concerned in this enlargement [of the system of control of materials and transportation] feel very certain of the ground on which they stand. They have proceeded on the most conservative basis. They have depended, not on speculation and theory, but on facts and figures. They have gauged the future very carefully by the past. They have built the new enterprises, not in the belief that they can effect a monopoly, but in the belief that they can so expand the system of economies that every one will profit, the consumer and the workingman most of all.

"Supremacy in handling and transforming the raw products of the earth is to be won, not by monopolizing their production, but by handling them in such a scientific manner, in the process of manufacturing that the cost is kept down to the lowest possible figure. A monopoly in the iron and steel business is an impossibility. No man or set of men could possibly bring such a thing about. No rational person would dream of attempting it. A monopoly of the wheat fields of Minnesota and the Dakotas, or of the fruit groves of California, would be simple by comparison.

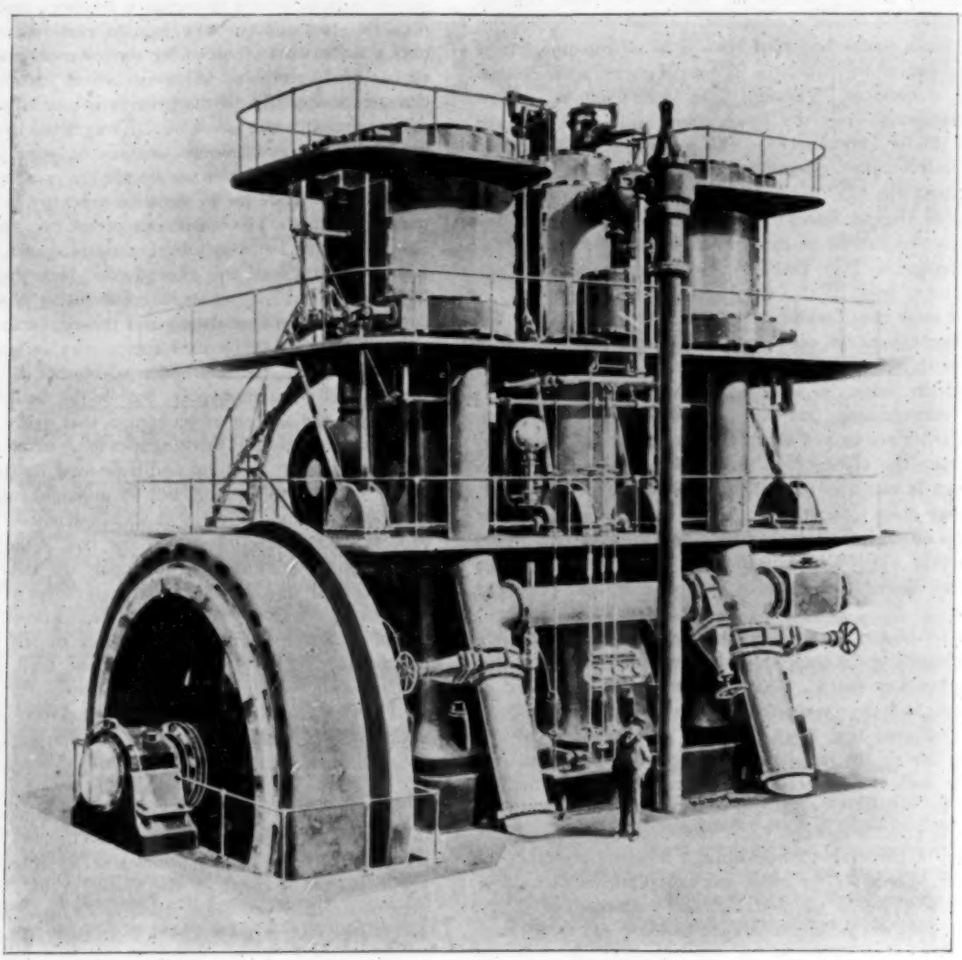
"The chance is remote, however, that the issue of consolidation will ever come up squarely at the polls, and with each succeeding day the prospect of this is bound to grow less. It is a clean-cut business proposition, and has no more place in politics than a question prescribing a general style of type in newspapers would have. . . . The iron and steel industry in America is not apprehensive of antagonistic political action toward it either by the people or by Congress. It has done more than any other industry to make this nation great and prosperous, to give America commercial supremacy in the foreign markets. The improved processes that have come out of its pursuit have revolutionized many other industries, and made them in turn great and prosperous. In the face of this satisfactory state of affairs all around, the political and other straws that Mr. Sage sees blowing about the atmosphere, as a menace to 'consolidated management,' fail to awake any apprehension in the minds of the men in the steel business."

The rolling department of the Tyler tube mills, located at Washington, Pa., are again in operation. The mills were temporarily shut down owing to a strike of tube men, but as the rollers are members of the Amalgamated Association they were not affected by the strike. The furnaces in the tube department are being allowed to cool off and there is every indication that this department will be shut down indefinitely.

After a successful trial of ten days, the coupling department of the Youngstown, O., plant of the National Tube Co. was placed in operation last week. Heretofore this plant depended upon the Middletown, Pa., plant of the tube combine for couplings.

MAMMOTH WESTINGHOUSE ENGINES.

The Westinghouse Machine Co. of East Pittsburg, Pa., has just completed the first of eight 6,000-h. p. steam engines ordered by the New York Gas & Electric Light, Heat and Power Co. The engine, though only nominally able to produce 6,000-h. p. can develop 10,000-h. p. should the occasion demand. Some idea of the proportions of the engine can be obtained when it is said that more than 10,500 separate pieces of metal enter into its construction and its gross weight is more than 1,500,000 pounds. The height of the engine from the floor line to the top of the cylinders is 37¼ feet and the width across the front is 41 feet. The diameter of the fly wheel is 23 feet. The base of this engine, cast in three pieces, weighs 100 tons. Upon this base are set the three A frames with circular flange tops, upon which are bolted the cross-head guide frames. These guide frames are in turn surmounted by the cylinders, one high pressure and two low pressure. Circumscribing the engine frame are three iron platforms, located at the juncture of the A frame with the cross-head guide frame, the cross-head guide frame with the bottom of the cylinders, and the top of the cylinders respectively. These three platforms are connected with each other by spiral iron stairways, and to the ground by means of a stairway descending from the lowest platform.



6,000-HORSE POWER WESTINGHOUSE ENGINE.

Being of the three-cylinder cross-compound type, this engine represents the best engineering practice as applied to large units. There is one high pressure cylinder 43½ inches diameter, and two low pressure cylinders each of 75½ inches diameter. The stroke is 60 inches, and the speed 75 revolutions per minute. The high pressure cylinder has balanced poppet valves actuated by a releasing gear, and the low pressure cylinders Corliss valves operated by the usual wrist plate and tie rods. It should be noted that this is a comparatively rare combination of valves; the reason for using poppet instead of Corliss valves on the high pressure cylinders is that the entering steam at 175 pounds pressure is super-heated 200 degrees, making the actual temperature 577 degrees Fahrenheit. At this temperature it is practically impossible to provide the efficient lubrication necessary to the satisfactory working of Corliss valves.

The engine is condensing, and a vacuum of 26 inches is maintained at all times. A reheating receiver is placed at the middle of the cross-head guide frame, and extends clear across the front elevation of the engine. This heater contains 110 tubes, giving a total of 1,200 square feet of heating surface. The low pressure cylinders are steam jacketed to prevent the loss of heat energy by radiation.

An interesting departure from ordinary engineering practice is to be found in the way motion is given to the eccentrics that control the valve movements. Usually the eccentrics are mounted directly on the main shaft; in this instance the eccentrics are mounted on a lay shaft located at the rear of the engine, a few inches above the level of the first platform. This auxiliary shaft is driven by a spiral gear. The advantages to be derived from moving the eccentrics in this way are manifold; the chief one is, however, the saving of energy by reducing the size of the eccentric straps. The diameter of the main shaft is 29½ inches, the diameter of the lay shaft is 6 inches; the eccentric straps and the friction caused by their rubbing surfaces are reduced accordingly.

The main shaft is of open hearth, fluid compressed, hydraulic forged steel, the connecting rods are of the same material, and both were supplied by the Bethlehem Steel Co. The shaft is 29½ inches diameter at the fly wheel fit and 26 inches diameter at the bearings; it has a ten inch hole through the center of that portion located between the bearings, and a nine inch hole at the bearings—this hole, of course, being parallel to

the axis of the shaft. The total weight of the main shaft is 136,000 pounds.

The fly wheel center is of air furnace iron, the arms and rims of cast steel. The central portion is cast in five segments, each consisting of two arms and 72 degrees of the rim. These are joined by I links shrunk into pockets in the sides, and are bolted to the hub, making a cast steel fly wheel 23 feet in diameter. The rim is strongly reinforced in such a way as to give practically three rings running together, each self-supporting as to centrifugal force.

The generator armature is pressed on to the shaft alongside the fly wheel, and in addition to being securely keyed to the shaft it is rigidly attached to the fly wheel center, or hub, by means of direct bolting. The outer end of the generator shaft is supported by a heavy pedestal carried on an iron sub base.

Though this engine is somewhat more powerful than either of the two recently built for the Bay Ridge station of the Kings County Light & Power Co., the fly wheel is considerably smaller. A construction possible in this case because the cranks are arranged in the best position to give an even turning moment—cranks being separated by 120 degrees—a condition that is obviously not possible to attain in any two cylinder engine.

Work has already commenced on several of the other 6,000-h. p. engines for the New York Gas, Electric Light, Heat & Power Co., and the big machine shops of the Westinghouse company are being worked to their full capacity. In addition to this order the Westinghouse, Church, Kerr & Co. engineering firm has secured contracts for, and the Westinghouse Machine Co. is building, 16 engines, of 5,000-h. p. each, for the Third Avenue Railway of New York, two of the same capacity for the Boston Elevated Railway, and two of 1,500-h. p. each for Manchester, Eng.

Castings of High-tension Bronze.

The demand for castings of high-tension bronze necessitated by the general use of high steam pressures has led to the production of a number of alloys, all giving excellent results in the testing machine. It has, however, been discovered that much greater care has to be taken in the foundry than is necessary with ordinary gun metal or brass work, since most of the alloys in question contain an unusually high percentage of zinc, and mixtures of this character are very sensitive to the slightest oxidation in the melting process. The French Admiralty specifications demand that castings of these high-tension bronzes should show an elastic limit of 27,000 lb. per square inch (16 kilos. per square millimetre), an ultimate strength of 49,700 lb. per square inch (35 kilos. per square millimetre), an elongation of 18 per cent in 4 in. The standard specimens are of circular section, being 0.543 in. in diameter, and they are cut from actual castings, and are not merely specimen bars. Specimens showing a less tensile strength than 35 kilos. per square millimetre are accepted, provided that this departure from the standard is compensated for by increased ductility, though no specimen is regarded as satisfactory in which the strength falls below 42,600 lb. per square inch, or in which the elongation is less than 15 per cent in 4 in. If over one-quarter of the sample bars fail to pass the prescribed tests, the batch of castings is rejected. In addition to the above, the authorities also require that the absence of porosity in castings intended for steam fittings shall be proved by hydraulic pressure, which in different cases may amount to from 142 to 711 lb. per square inch. More recently drop tests have also been specified. The alloys used include Delta, Parsons, and Stone bronzes, as well as some mixture of Continental origin. Certain mixtures used at the foundries of the Forges et Chantiers de la Mediterranee are described by Gauger in the "Bulletin Technologique," together with some particulars as to the shop practice. The ferro-manganese bronze used is as follows: Red copper, 65 parts; zinc, 33 parts; ferro-manganese containing 50 per cent Fe., 7 parts.—[Kuhlow's.

The American Bridge Co. will furnish the Illinois Central Railroad Co. all the bridge work required on this railway during 1901. About 3,000 tons of steel will be used.

STOVE MANUFACTURERS' CONVENTION.

The 30th annual convention of the National Association of Stove Manufacturers, in connection with which is also held the annual meeting of the Stove Founders' National Defense Association, is in session in Boston this week. Monday and Tuesday were reception and entertainment days and Wednesday and Thursday were scheduled for the papers and discussions which are a feature of the National Association of Stove Manufacturers' meetings. After the address of President Stanhope Boal, of Piqua, O., on Wednesday, the association took up for discussion the following question: In what manner and to what extent is the "Association Cost Formula," adopted some years ago, affected by the increased use of steel in the manufacture of our product? Should it be modified? If so, in what respect? The following named gentlemen will participate in the discussion: Edmond Raftery, Aurora, Ill.; J. W. Van Cleave, St. Louis, Mo.; G. B. Gunderson, Detroit, Mich.; H. W. Buttorff, Nashville, Tenn.; C. A. Ducharme, Detroit, Mich., and J. W. Boehne, Evansville, Ind.

The subjects for consideration by the association, with the names of the members participating, are as follows:

"Consolidation: What Kind of a Consolidation Is Best Suited to the Stove Business?"—Grange Sard, Albany, N. Y.; Henry Cribben, Chicago; George H. Barbour, Detroit; A. C. Mott, Philadelphia; J. W. Van Cleave, St. Louis; Charles H. Bradley, Pittsburg, and E. W. Anthony, Boston.

"Can the Golden Rule Be Profitably Applied in the Relations of the Stove Manufacturers to Each Other?"—William J. Myers, New York; Edward Bowditch, Detroit; George H. Barbour, Detroit; A. N. Parlin, Boston; Charles S. Prizer, Reading, Pa.; H. Terstegge, Louisville, Ky.; A. Brentano, Evansville, Ind.

"The Value and Profit of Association," paper by Fred W. Gardner, Chicago, Ill.

"The Disastrous Effects Attending Unwarranted Reductions in Selling Prices in the First Four Months of the Year," Grange Sard, Albany; Geo. H. Barbour, Detroit; P. B. Acker, New York; Jos. P. Ouerbacker, Louisville, Ky.; F. W. Knauss, Portsmouth, O.; N. H. Burt, Leavenworth, Kan.; D. McAfee, Quincy, Ill.; M. B. McKnight, Reading, Pa., and W. E. Walker, Taunton, Mass.

"Export Trade—How Can It Be Developed?" Report of committee, of which Wm. J. Myers, of New York City, is chairman.

"To What Extent Are Steel Ranges, Steel Cooks and Steel Heaters Affecting the Trade in Cast Goods?" "What Effect Are Malleable Iron Constructions Going to Have Upon Cast Iron and Sheet Steel Goods?"—J. W. Van Cleave, St. Louis; John M. Dwyer, Detroit; R. A. Culter, Peoria; J. H. Bradley, Pittsburg; E. C. Hanrahan, Chicago; J. W. Emery, Quincy, Ill., and Fred Sattler, Belleville, Ill.

"Breakage of Stoves in Transit," paper by W. S. Todd, Cincinnati.

"Expansion in the Stove Business; Its Pitfalls and Dangers," paper by Charles S. Prizer, Reading, Pa.

"Stove Guarantees; What Should They Cover, and How to Protect Ourselves Against Unjust Claims on this Account?" Lewis Moore, Joliet, Ill.; Abram C. Mott, Philadelphia; W. G. Henry, Chicago; C. P. Brecher, Louisville, Ky.; C. W. Scott, Cleveland; W. S. Todd, Cincinnati; W. H. Flanders, Syracuse, N. Y., and Edward F. Hill, Peekskill, N. Y.

The present officers of the association are: President Stanhope Boal, Piqua, O.; vice-presidents, P. B. Acker, New York City; Jeremiah Dwyer, Detroit; treasurer, Walter S. Stevenson, Philadelphia; secretary, Thomas J. Hogan, Chicago. Central Executive Bureau—A. C. Mott, Philadelphia; H. W. Buttorff, Nashville, Tenn.; E. W. Anthony, Boston; W. A. Clark, Geneva, N. Y.; W. H. Sard, Chicago; Stanhope Boal, Piqua, O.; and Thomas J. Hogan, Chicago.

The government of New South Wales is inviting tenders for 100,000 tons of steel rails to be manufactured in New South Wales. It is stipulated that the price is not to exceed the cost of such rails in the United States and Great Britain, plus the freight. An effort will be made to establish a rail mill.

A DANISH WIRE NAIL WORKS.

The Northern Cable & Wire Mfg. Co., which has headquarters at Copenhagen, Denmark, operates two wire and nail plants, one at Copenhagen and the other at Middlefort, which is 100 miles from Copenhagen. The company manufactures cable and wire, and in addition has a large output of wire nails. In our issue of last week we presented a description with illustrations of the latest wire and wire nail plant in the United States. It will be of interest, therefore, to note this typical Danish plant, which was equipped to a considerable extent with an American transmission outfit and American machines. The president of the company is H. P. Prior, who for a number of years was in the employ of the General Electric Co. at Schenectady, N. Y.

Fig. 1 shows a portion of the nail works, in which are three lines of shafting, which with the bearings, pulleys, etc., were furnished by the Dodge Mfg. Co. of Mishawaka, Ind.

There are two types of nail machines in use, some of German and some of American make. The German machines, however, are being displaced by the American make and it is the intention ultimately to have American machines exclusively. The shafts shown receive their power from pulley at extreme right end of line shaft in foreground, which is driven by a jackshaft not seen. The motive power is a 60-h. p. electric motor.

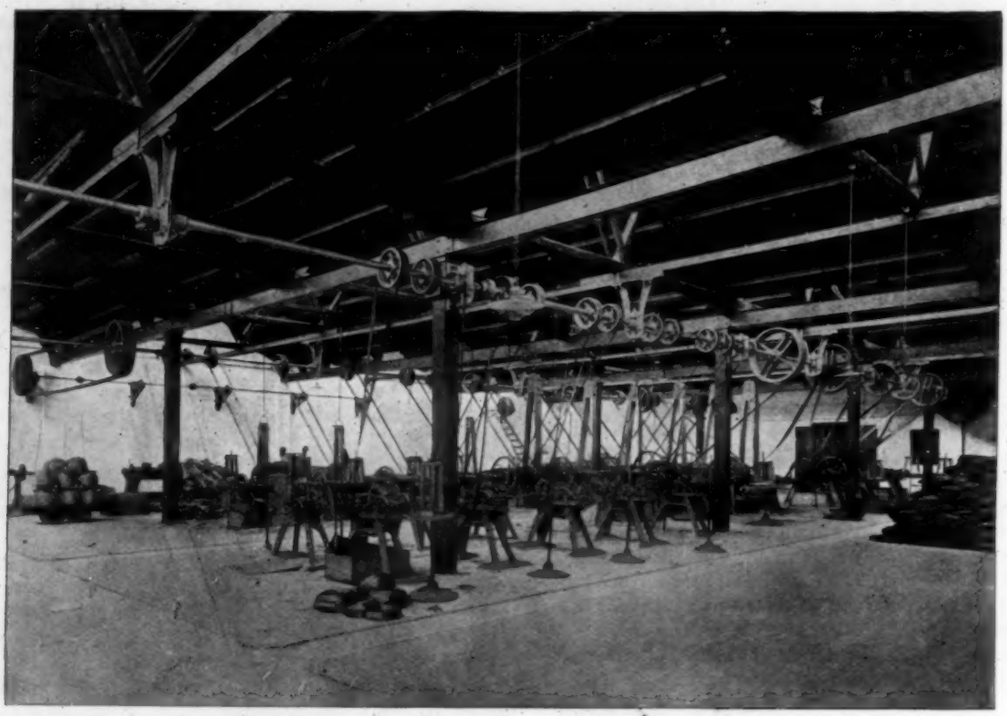


FIG. 1 —WIRE NAIL PLANT, NORTHERN CABLE & WIRE MANUFACTURING CO., MIDDELFART, DENMARK.

Fig. 2 shows a pair of variable speed taper cone pulleys used for driving the wire reels. This company employs about 160 men in this factory, and the shops have been running day and night since they started some time ago. The power transmission equipment was furnished by Nyeboe & Nissen of Copenhagen.

The William B. Pollock Co. and the Enterprise Boiler Co. of Youngstown, O., have been notified by the boiler makers employed in their shops that on and after June 1, they would demand 9 hours' work with 10 hours' pay.

At a meeting of the stockholders of the Pennsylvania Steel Co. held last week at Philadelphia, Edgar C. Felton was elected president. The following directors were selected: Luther S. Bent, Arthur Brock Evans, R. Dick, John Cassels, G. H. B. Martin, Edgar C. Felton, Francis I. Gowen, Effingham B. Morris, Frank W. Hunnewell, Edward T. Stotesbury, George Wood, William D. Winsor, Frank R. Hansell.

NEW BRIDGES TO IMPROVE CHICAGO NAVIGATION.

In removing the obstructions to navigation and the flow of water through the Chicago river, the trustees of the sanitary district of Chicago who have this problem in charge are pushing their work vigorously. The first and probably the most important part of the plan is that for the ultimate removal of the center-pier swing bridges. The swing bridge at Taylor street has been entirely removed and replaced by a Scherzer rolling lift bridge, recently completed. The specially obstructive railroad bridge near the Taylor street bridge will be removed within a few months, as the new double-track Scherzer rolling lift bridge of 275 feet movable span will soon be completed and placed in service. Contracts have been awarded and work has commenced upon the new Scherzer rolling lift bridges replacing the swing bridges at Canal and Main streets. Bids are advertised to be submitted May 8, 1901, for a Scherzer bridge to replace the swing bridge at Randolph street.

The Scherzer Rolling Lift Bridge Co., 1610 Monadnock Block, Chicago, has also recently completed plans for a new bridge at State street to replace the present swing bridge, which was seriously obstructive to navigation on account of a sharp bend in the channel of the river at the site of this bridge. The new bridge will give a clear, unobstructed channel for navigation 140 feet wide; the movable span, center to center of bearings, will be 161 feet 8 inches; the roadways, center to center of trusses, will be 40 feet 6 inches wide, with two sidewalks each 11 feet wide. As State street is the principal retail business street of Chicago, and the bridge is near the business center, it was decided to make the outlines of the new bridge as artistic as possible without increasing the present cost of the structure. The bottom chord is arched and the top chord projects but slightly above the roadway, thus giving a deck bridge with an unobstructed view. The new bridge will not only facilitate navigation, but will present a striking contrast to the present unsightly one.

Plans have also been completed for new Scherzer rolling lift bridges to replace the swing bridges at Harrison street and 18th street, and within a few weeks the Scherzer company will have completed plans for a new bridge to replace the swing bridge at Polk street. All of the above new bridges will give an unobstructed channel of 140 feet in width, or wide enough to pass side by side two of the largest lake or ocean vessels likely to enter the harbor of Chicago for many years. The wide channels provided will enable vessels to pass these

bridges rapidly, and time will also be saved as all bridges are designed to be operated by electricity and may be opened or closed within 30 seconds.

As soon as these bridges are completed and placed in service, the work of removing the other obstructive swing bridges can be proceeded with, without unduly obstructing the street traffic across the bridges. After all the swing bridges have been removed and replaced by the more modern type of bascule bridge and the obstructive tunnels have been lowered or removed, the largest lake vessels can readily and rapidly reach any point along the 56 miles of dock frontage comprising the present internal harbor of Chicago, and the delays heretofore caused by the slow passage of the vessels through the narrow openings provided by the old swing bridges will be obviated. The highway traffic will also be greatly facilitated as the present comparatively small and frequent vessels will be replaced by larger vessels, less frequent but carrying a larger tonnage.

The large, comprehensive plan under which the harbor improvements at Chicago are now being executed so vigorously indicate that Chicago will not only retain all of its present large marine commerce, but that it will also be prepared for the larger vessels and great increase of marine commerce that would follow the completion of an adequate ship waterway within the United States.

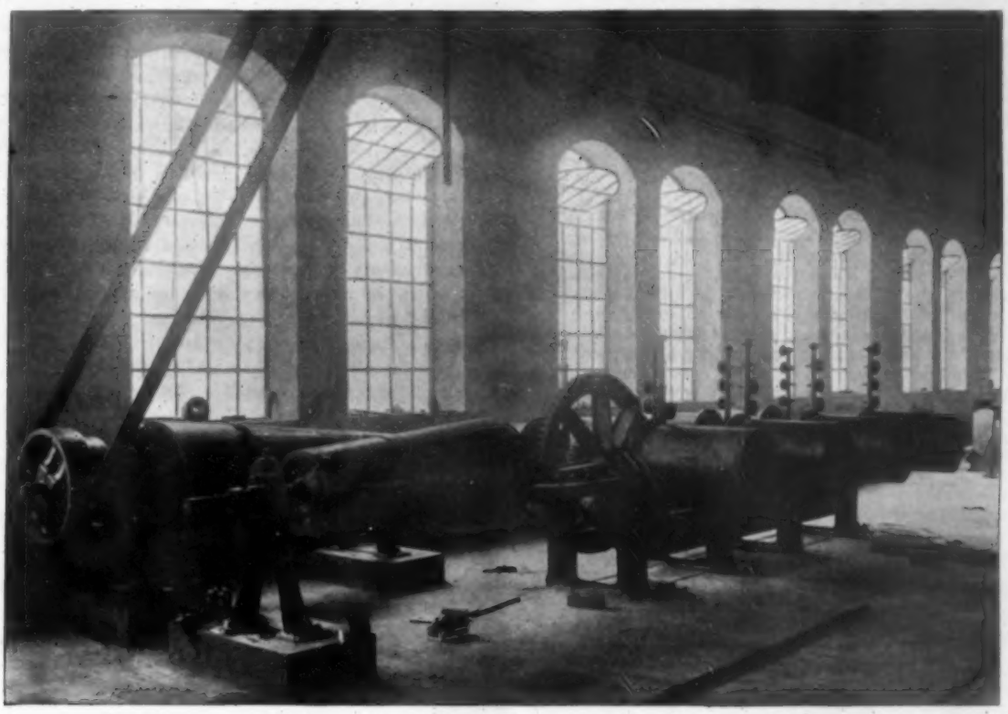


FIG. 2.—TAPER CONE PULLEYS OPERATING WIRE REELS AT WIRE MILL, NORTHERN CABLE & WIRE MANUFACTURING CO., MIDDELFART, DENMARK.

At a meeting of the board of directors of the H. C. Frick Coke Co. held at Pittsburg last week, Messrs. Giles B. Bosworth, George Lauder and James Gayley resigned as members of the board. Mr. Bosworth also resigned as vice-president and treasurer. The resignations were accepted and O. W. Kennedy, William C. Magee and Phillip Keller elected to fill the vacancies. Mr. Keller was also elected to the office of treasurer, the office of vice-president resigned by Mr. Bosworth remaining unfilled. W. S. Armstrong was appointed assistant treasurer. William C. Magee retains the title and office he has held heretofore of vice-president and general sales agent.

At Buffalo the machinists in a number of shops have struck for a shorter day and increased pay. It was reported that several hundred were out at the close of last week. The manufacturers have had a number of meetings and the situation will be met by concerted action.

CLOSER ALLIANCE OF LABOR UNIONS.

Labor leaders not only of the metal trades but of other labor organizations are now proposing the affiliation of all labor organizations under one head. President Gompers of the Federation of Labor will meet President Shaffer of the Amalgamated Association for the discussion of this question in New York this week. President Shaffer takes the following view of the proposed consolidation of interests:

"The trusts have been organized as central bodies and labor should take the same step, being identical interests. I believe that in dealing with these big companies there should be a general organization to point out the policy and a strong executive to carry that policy into effect. The organization of the combines has been a precedent for us to take up and follow without fear of criticism. In my report last year I predicted just what has come to pass in the steel trade. I forecasted the amalgamation of the sheet, tin plate and other iron and steel concerns, about as it has occurred in the formation of the United States Steel Corporation. A year ago I made a tour of the country and warned our people of what was coming. I believe that centralization of the labor unions—or a trust, if you will—is the proper thing to undertake now.

"The popular demand is so strong for some defensive alliance between the trades that do not wish to be merely a rope of sand, that no labor organization official can afford to ignore it. I am in receipt of letters from all sections of the country, some of which contained excellent suggestions for the formation of a new central body, but all asking that whatever central body is used as a defense to the separate trade organizations, it shall be made alert and aggressive and not a sinecure for well-paid labor officials. The scheme of amalgamation that has been suggested by prominent Pittsburg labor officials is one embracing actual co-operation between all labor bodies in case of any disturbance in conditions in any one of them. The details for the plan would, of course, be a matter for the future.

"In addition to this it would be wise, probably, to arrange that all wage agreements of the allied organizations should terminate on the same day. This would entail an annual wage settlement in all the allied trades and would provide those trades unable to agree with a lever that would compel a fair arbitration of the matter in dispute. Under the alliance it should be understood that individual trades settlements are contingent on the settlement of the wages of all organizations in the federation of trades."

SITUATION IN MILWAUKEE MACHINE SHOPS.

The machinery manufacturers of Milwaukee belonging to the National Metal Trades Association had a meeting on Saturday evening, May 4, and adopted the resolutions below as their answer to the demand made by the International Association of Machinists for a 9-hour day and an advance of 12½ per cent in the hourly rate of wages, to take effect May 20. The curtailment of output already made by the reduction of hours from 10 to 9½ has very considerably reduced the earning power of the shops, and it is the sense of all these Milwaukee firms that the additional reduction in hours will entail all the loss the manufacturer can stand, without advancing wages. The resolutions follow:

Resolved, That in reply we decline to grant such demand and refer all parties concerned to the provisions for the settlement of any dispute that may arise embodied in the New York agreement, and also covered by the resolution adopted at the conference between the Administrative Council of the National Metal Trades' Association and the officers and board of trustees of the International Association of Machinists in joint session at the Murray Hill Hotel, New York City, Nov. 16, 1900, which reads as follows:

Whereas, In the joint agreement adopted by the administrative council of the National Metal Trades Association and the International Association of Machinists, it was agreed that all pending disputes and disputes hereafter to arise between members of the respective organizations—that is, between an employer and his employe or employes—should be settled by arbitration, and;

Whereas, It was further agreed that, pending such arbitration, no strike or lock-out should occur; be it

Resolved, That for the purpose of providing means by which the employer or employes may derive the benefits of this agreement, the following methods shall be pursued:

When a dispute shall arise between an employer and his employe or employes, every reasonable effort shall be made by the same parties to effect a satisfactory adjustment of the difficulty. And in case such difficulty cannot be settled between the employer and his employe or employes, it shall be referred, on the part of the member of the National Metal Trades Association, to the chairman of the district in which he is located; and by the employe or employes, to such representative as he or they may select, who shall by all means in his or their power endeavor to adjust the difficulty to the satisfaction of both parties.

Should this committee fail to make such adjustment, then either party shall have the right to ask for a conference between the presidents of the two associations or their representatives. In the event of their being unable to adjust the differences satisfactorily, then it shall be referred to arbitration, as provided in the agreement of May 18, 1900. The findings of this arbitration, by a majority vote, shall be considered as final as regards the case at issue.

Pending adjudication by arbitration there shall be no cessation of work at the instance of either party to the dispute.

Secret of American Engineering Success.

The difference between American and British engineering practice has been brought out prominently in articles in the London *Times*, already published in book form in this country, and in replies to these articles. In the last of the *Times* series, printed recently, the British engineer critic discusses "The Human Factor" and charges his countrymen with failing to recognize young men. Some of his contrasts are reproduced in the following:

"The American hustles from his boyhood; the Briton plods. It is a detail that the American workman hustles for ten hours a day; the Briton plods, so far as popular opinion and shop stewards allow, for nine. . . .

"If American blast furnace practice is more productive than our own; if American steel works are better equipped than our own; if American machine tools are more ingenious than our own; if American electrical plant is commanding even our own market; to whatever we turn we find it is the human factor—character—that commands the situation. Even the rich iron ore of the Lake Superior district, far distant from the place where it is used, has been made available by the ingenuity and enterprise of American engineers and men of business. This thing is patent, and yet, in discussing the problem, we avoid it.

"What the conditions are that have brought the present state of affairs about may perhaps be summed up in one phrase—our overwhelming success in the past. We have thought ourselves secure; we have relaxed vigilance and eased the burden. Our young men are kept back until their best energies have run to waste; and we have a system of labor employment which strives, not without success, to keep labor at an average of the lowest level.

"It is the wise conception of what will work out to his own advantage which so largely distinguishes the American business man. Such a gift does not come without seeking. It means thinking of business with a concentration of mind that, to the average European, is 'phenomenal.' To the American business is a science, and he follows it almost with the enthusiasm of a scientific devotee. No risk of personal discomfort is too great; his alertness is never at fault; success does not blunt his devotion. The Briton is educated to a hundred distractions; in America there is practically no leisured class of young men."

The Ingot Mold Consolidation.

The American Ingot Mold Co. was organized last week in Pittsburg, to take over the ingot mold business of the Mesta Machine Co., Marshall Foundry & Construction Co. and William Yagle & Co. of Pittsburg, and the plants and business of the T. D. West Foundry Co. at Sharpsville, Pa., and James E. Thomas of Newark, O. The capital stock is nominally $50,000. Officers were elected as follows: George Mesta, president; George H. Boyd, of the T. D. West Foundry Co., vice-president; Edward Thomas, of James E. Thomas Co., treasurer, and Reed F. Blair, representing the Marshall Foundry & Construction Co., secretary. Offices have already been established in the Lewis Block, Pittsburg. The ingot mold departments of the Mesta Machine Co. and William Yagle & Co. will be closed down when the new company takes charge of the plants on July 1. Contracts are already being closed for molds for delivery after July 1. The annual output of the three foundries to be operated by the new combination will be about 100,000 tons annually. The new company will endeavor to deliver molds to steel producers more cheaply than ever before. This can be done by exercising the numerous economies only possible by combination. While contracts heretofore have only been closed for six months the new company will endeavor to close contracts from 3 to 5 years, based on the selling price of Bessemer pig iron. The ingot mold department of the Vulcan Foundry & Machine Co. at New Castle, Pa., is not included in the consolidation.

The annual convention of the International Association of Tin Plate Workers began its sessions in Cleveland, May 6, the president, George Powell, of Elwood, Pa., in the chair. Nearly 50 delegates were present, representing over 3,000 tin plate workers. The convention will last through the week. Charles Lawyer is secretary. The present wage scale expires July 15, and the men will ask for some advance.

The National Cash Register Co., Dayton, O., posted the following notice on May 3: "Owing to difficulty with our molders, the factory will be closed till further notice." Last week four molders were discharged, the managers say, for cause, and the molders struck for their reinstatement. Then the polishers joined the demand for the return of the men, and threatened a sympathetic strike. The managers announced that if the polishers struck they would close the factory for an indefinite period. The polishers struck May 3.

Officers of the United States Steel Corporation have denied that the purchase of the Leyland Steamship Co. by J. P. Morgan was made in the interest of that company. While it expects to carry on a large export business it was said no arrangements have been made for its ocean transportation, and so far that feature has not been considered by the executive committee.

Some hoisting machinery has recently been sold by the Brown Hoisting Machinery Co. to parties at Oxelosund, Sweden to be used in handling ore at that point.

The Balkwill Pattern Works of Cleveland announce that after May 1 and until the completion of their new building they will be located at No. 1146 Hamilton St.

TRADE PUBLICATIONS.

Willis Shaw, 626 New York Life Building, Chicago, is distributing a pamphlet which is entitled "Shaw's Booklet of Bargains in Machinery." It contains descriptions of the various pieces of machinery which he has for sale. The catalogue is very attractively gotten up.

We have received from the Chicago House Wrecking Co., 35th and Iron Sts., Chicago, a copy of the last issue of its monthly bulletin, which contains descriptions of the machinery it has for sale.

The Webster Mfg. Co., 1075 West Fifteenth St., Chicago, sends this office copies of Catalogues M and K, recently published. The former is confined solely to elevating and conveying appliances and the latter to power transmission. Both are plentifully illustrated and are bound in flexible cloth covers.

The Bates Machine Co., Joliet, Ill., has recently published a catalogue containing cuts, diagrams and descriptions of the various types of Corliss engines manufactured by it, with half-tone illustrations showing installations of these engines in various parts of the country. This company is represented in Chicago by G. W. Mullins, whose office is at 226 LaSalle St.

The Tudor Boiler Mfg. Co., Cincinnati, O., has published a handsome catalogue describing the Tudor horizontal and the Lynn vertical boilers and illustrated with views of both, The catalogue also contains articles on coal, smoke, water, heat, steam and horse power, making it of value to every one interested in power production.

The Arcade Mfg. Co., of Freeport, Ill., manufacturer of hardware specialties, gray iron castings and nickel plated work, has brought out a complete catalogue, fully illustrated, which will be sent on application.

The latest publication of the American Engineering Works, 204 Dearborn St., Chicago, is devoted to American steam stamps. Details and illustrations are given of this stamp, which is designed for recovering from ore the largest value at the lowest first cost and subsequent cost of operation and maintenance. Suggestions are given by the compilers as to the most advantageous boiler plant, crushers, etc., to be installed for handling various ores.

C. Hanika & Sons, of Muncie, Ind., and Celina, O., illustrate in a new catalogue some of the products of their architectural iron works. Many designs are shown of ornamental iron work for building exteriors and for grill work for interior ornamentation. Iron and wire fences are also a specialty. Increased facilities are given by the works recently built at Celina.

The Gobeille Pattern Co., of Cleveland, has addressed a tasteful leaflet to stove founders, making timely suggestions relative to patterns in that line.

INDUSTRIAL SUMMARY.

[If you are in need of machinery of any description, please notify *The Iron Trade Review*, and we will put you in communication with our advertisers at once.]

New Buyers in the Market and Some of Their Wants:—

The McMyler Mfg. Co. of Warren, O., has completed plans for its power house, and will shortly be ready to receive bids on engines, boilers and electrical equipment.

The Lambert Gas Engine Co., Anderson, Ind., is in the market for a 52-inch engine lathe.

The Standard Traction Brake Co. has been incorporated at Jersey City, N. J., by H. Herman Westinghouse, Edwin M. Herr and Robert S. Green for the manufacture of brakes for cars. The capital is $100,000.

The Beacon Metal Co. of Woodstown, N. J., are incorporated to manufacture anti-friction metal. The capital is $150,000 with the following incorporators: Christian S. MacCain, Wm. S. Clawson, Samuel J. Taylor and F. Norman Dixon.

The American Engineering Specialty Co. is incorporated at Chicago with a capital of $200,000 by Jos. MacWilliams, Jas. H. Davis and Wm. B. Pickels.

The Wheeling Can Co. was incorporated last week with a capital of $300,000 to engage in the manufacture of tin cans. The incorporators are N. E. Whitaker, A. C. Whitaker, Alexander Glass, G. A. Laughlin and O. J. Johnston. With the exception of Mr. Johnston, the incorporators are members of the Whitaker Iron Co. and the Wheeling Corrugating Co.

The Illinois Machine & Foundry Co. has been incorporated at Chicago by Josiah Cratty, Wm. H. Duval and Edward J. Hamel with a capital of $50,000.

The Union Mfg. & Supply Co. of Pittsburg has applied for a Pennsylvania charter with a capital of $40,000. The new concern will deal in general plumbers' supplies, B. F. Cullen, F. H. Cullen, A. M. West, C. F. Dean, F. S. Cousley and H. F. Weaver are the incorporators.

The Schwab Safe Co. of Fostoria, O., has reorganized for the purpose of adding a stove foundry. The name of the company has been changed to that of the Schwab Safe & Stove Co. The authorized capital is $50,000.

The Willoughby Dock Co. acting for the Brier Hill Iron & Coal Co. and the Youngstown Steel Co., last week purchased 40 acres of land at the mouth of the Chagrin river, in Ohio. It is probable that docks will be built this summer. The company has a capital of $60,000 and the incorporators are E. L. Ford, J. G. Butler, Jr., George Tod, H. H. Stambaugh and John Stambaugh, Jr. The incorporators have also projected a railroad from Willoughby to Youngstown, O.

The Illinois Machine & Foundry Co. of Chicago, Ill., has been incorporated with a capital of $50,000 to manufacture machinery and castings. J. Cratty, W. H. Duval and E. J. Hamel are the incorporators.

The Schonthal Iron & Steel Co. of Cumberland, Md., has been incorporated at Cumberland, Md., to operate the plant of the Potomac Steel Co. The lease of the mill was taken over by this company some time ago.

The Oshkosh Malleable Iron Co. of Oshkosh, Wis., has been incorporated with a capital of $100,000. The concern will manufacture malleable, gray iron and brass castings. Elmer Leach, C. A. Libbey and J. J. Williamson are the incorporators.

R. G. Beker, with headquarters in the New England Building, Cleveland, O., has formed the Finished Rivet Co. which will locate a plant at Bedford, O. The machine shop will be 40x65 feet while the stock room will be 60x136 feet. In addition there will be building for the finishing and rivet machine departments. There will be 12 furnaces and machines in the plant, which will be fitted up with the most improved machinery, including conveyors, cranes, etc. The capacity will be 100 tons daily. Rivets from ½ to 1¼-inch will be manufactured.

The Beacon Metal Co. was granted a New Jersey charter last week with a capital of $150,000 to manufacture and sell anti-friction metals. C. S. McCain, S. J. Taylor, F. N. Dixon and W. S. Clawson are the incorporators.

The Buffalo Tin Can Co., capital $500,000, was incorporated at Trenton, N. J., last week.

The Braunsdorf-Mueller Co. of Elizabeth, N. J., has been organized to manufacture hardware specialties. The capital is $100,000 with the following incorporators: Henry R. Braunsdorf, Charles F. Mueller, and Frederick H. Clauss.

New Construction:—

The Standard Steel Works of Lewiston, Pa., will erect a new machine shop, 125x175 feet in size.

The Lalance-Grosjean Co. of Harrisburg, Pa., will install a new tin mill. The plant is being operated at its utmost capacity at the present time and the installation of the new mill is absolutely necessary to supply the big demand for tin plate made by this company.

The Garland Chain Co., Rankin Station, Pa., has about completed two new buildings 100x150 and 100x200 feet. These were erected by the American Bridge Co.

The Hartman Mfg. Co. of Ellwood City, Pa., will erect a rod mill adjoining its present plant during the summer. As the mill will probably produce a greater tonnage than used at present in wire making for fence purposes it is probable that the surplus output will be used in making wire nails. The Hartman Mfg. Co., which was recently reorganized, now has a capital of $250,000 invested. A proposition is under advisement to increase the stock issue. The officers under the new

organization are Frank A. Umstead of New York, president; John F. Plummer of New York, vice-president; William L. Kiefer, secretary, and Willis Elton, general sales agent.

The Marion Steam Shovel Co., Marion, O., is having plans prepared for a blacksmith shop to be 80x225 feet in size.

The Hardie-Tynes Foundry & Machine Co. of Birmingham, Ala., expects to have its new plant in operation on June 1st. It comprises a foundry and machine shop, each 100x160 feet, and so laid out that they may be extended to 300 feet.

The pattern shop is 50x60 feet, and two stories high. All the shops will be equipped with the most modern machinery.

The Cambria Steel Co. of Johnstown, Pa., made contract with the Erie City Iron Works, Erie, Pa., for a building 122x550 feet.

The Metal Castings Co. of Springfield, Mass., which has been organized with a capital of $150,000 to manufacture castings by a patented process, has made a proposition to the board of trade of North Adams, Mass., to locate its foundry in that city.

The Kewanee Boiler Co. of Kewanee, Ill., which completed an extensive new plant last fall, has already found it necessary to make enlargements. The new addition will be 40x96 feet, and like the main building, will be composed of brick walls with a steel truss roof, and will be occupied by the sheet iron department. The quarters at present used for this will be utilized in enlarging the boiler department. Another hydraulic riveter will be installed, making four of these machines which the company has in operation.

The National Machinery Co. of Tiffin, O., manufacturers of bolt, nut, wire, nail and special machinery has purchased additional ground on which it will erect an addition to its foundry, the latter to be equipped with modern and approved appliances.

An addition is being built to the Eagle Iron Works, Terre Haute, Ind., which will be used for the manufacture of mining cars.

The American Bridge Co. will furnish to R. H. Hood & Co., the structural steel for the N. Y. Central pier shed to be built on Pier No. 59 North river. This will require over 1,000 tons of steel work.

The capacity of the Sharon plant of the American Steel Casting Co. is being doubled. The additions will give the Sharon concern a larger capacity than any other branch of the company. The American Steel Casting Co. was among the first iron and steel concerns to take advantage of the benefits of consolidation. It was incorporated in New Jersey about eight years ago with a capital of $3,338,700, of which $1,195,700 is 7 per cent cumulative preferred, and $2,143,000 common stock. It has been a regular dividend payer, and successful from the start.

The Safety Armorite Conduit Co., Rankin, Pa., has awarded the contract for a $10,000 two-story steel building, 50x200, to the American Bridge Co.

Work is to begin at once at Canton, O., a dispatch says, upon a six-mill tin plate plant in which W. J. Carnahan, of Pittsburg, and others are interested. The board of trade located the industry by buying a farm and selling lots.

It is reported that a company is being formed at Oshkosh, Wis., with a capital of $60,000, to construct a malleable iron factory in Oshkosh. C. W. Davis is interested.

At Sheboygan, Wis., the Phillip Myer Machine Co. will erect three machine shops.

The American Die & Tool Co., Wilmington, Del., contemplates erecting a three-story plant at Reading, Pa., according to plans in preparation by Muhlenberg Brothers.

The Muncie, Ind., Gas Engine & Supply Co., recently organized with a capital of $80,000, will erect a building. J. W. Smith, J. D. Williams are interested.

The Chattanooga, Tenn., Stove Co. has purchased a site on which to erect its new plant.

The Pittsburg District:—

The Clinton Iron & Steel Co. of Pittsburg, will blow in its blast furnace, which has been completely rebuilt within the past few months. It will go in on foundry iron and will have a capacity of about 250 tons daily. Operating on Bessemer or forge iron the daily output will be about 350 tons. The height of the stack is now 85 feet while the furnace will have a 17-foot bosh. Among the improvements are the addition of a McMyler slag handling apparatus and an automatic skip hoist built by Walter Kennedy.

J. J. Spearman of Sharpsville, Pa., and Hugh Kennedy of Pittsburg have entered suit against the Bellefonte Iron Co. to restrain the latter from manufacturing a valve for hot blast stoves.

The Pittsburg Locomotive Works last week received an order for two locomotives for shipment to Yucatan.

It is reported that the United States Steel Co. of Everett, Mass., will locate a plant in the Pittsburg district.

The retirement of the McCutcheon brothers as active operators of the Keystone rolling mill, located on Second Ave., Pittsburg, and the transfer of the plant to the new lessees, J. W. Rhodes & Co., took place last week.

F. N. Hoffstot, W. H. Schoen and A. R. Fraser of the Pressed Steel Car Co. deny any official connection with the proposed Standard Crucible Steel Co. Officials of the Crucible Steel Co. of America and others who recently resigned from the official board of the company also deny that they are interested in any way with the new project.

While the buildings for the new structural shops of the McClintic-Marshall Construction Co. at Rankin, Pa., are only half completed, the work of fitting structural material at the plant has already commenced. This is due to the fact that the company has an immense tonnage booked for construction at this plant during the summer.

The production of the 40-inch and open-hearth departments of the Duquesne Steel Works of the Carnegie Steel Co. at Duquesne, Pa., last month exceeded all previous records. In the 26 working days of April the 40-inch mill produced 26,249 tons and the open-hearth department 38,264 tons as against 22,752 and 32,702 tons respectively in February of this year, when the best previous records were made. Tonnage in other departments of the Duquesne mills during April were as follows: Blast furnaces, 62,268; Bessemer department, 48,079; 21-inch mill, 45,256, tons. A third heating furnace is being added at the Howard Axle Works of the Carnegie Steel Co. at West Homestead, Pa., which will increase the output about 33 per cent. The capacity of finishing axles is about 1,000 a day. During 24 hours recently 1,043 were turned out. With the new furnace added the output will be about 1,500 a day. Work on the new merchant mills to be erected at Duquesne is progressing very fast. The skeleton of the billet storage house is already up, as is also that of the heating furnace. The former building will be 40x260 feet while the latter will be 65x200 feet. The foundations of the buildings to contain the merchant mills are already completed. The buildings will be 100x200 feet in size. North of the mills the cooling and shipping departments will be located in a building 200x540 feet.

The Riter-Conley Mfg. Co. of Pittsburg was last week awarded the contract for the erection of the steel building to contain the plants of the Pittsburg Valve, Foundry & Construction Co. The building will be 275 feet long and 120 feet wide. A large foundry and other necessary buildings are already on the site upon which this shop is to be built.

Some important improvements will be made at the plant of the Paige Woven Wire Fence Co. at Monessen, Pa. The capacity of their rod mill will be increased 50 tons per day, and the output of the wire mill will also be enlarged. Six new rooms will be added to the works, making a total of 21. It is more than likely that the company may erect a blast furnace in the near future in order to supply itself with metal for its open-hearth steel plant.

Chicago District and Northwest:—

The Illinois Machine & Foundry Co. of Chicago has been incorporated at Springfield with a capital stock of $50,000. The incorporators are Josiah Gratty, William H. Duval and Edward J. Hamel.

The Sedgwick-Fisher Co., 53-55 South Clinton St., Chicago, has shipped two air compressors to J. S. Casement, San Jose, Costa Rica, South America, who has the contract for the erection of a bridge near that city. Each compressor has a capacity of 150 cubic feet of air per minute and are to be

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Section Through Centre. Vertical Form.

Represents an exceedingly simple and yet thoroughly efficient means for taking water out of live steam, or oil out of exhaust steam, without making the steam take such a crooked, tortuous passage that it becomes "tired" before it can pass into the outlet pipe. If there is any considerable body of water coming with the steam it is given the opportunity of flowing directly into the well of the COCHRANE SEPARATOR, and this well is so arranged that the current of steam cannot pick up or drive out the separated particles; the baffle in the COCHRANE SEPARATORS will stop the flying particles that come with the steam entering the Separator. Less than one half of one per cent of all the moisture entrained in the steam entering a Cochrane Separator will pass through the Separator, the conditions being anything like normal.

Steam travels very fast—a mile a minute is a little under the average velocity allowed in good engineering practice. The fewer the obstructions placed in the way of the steam, the more effective the steam will be at the end of its journey through the pipe.

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gives separation with the minimum loss from friction.

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HARRISON SAFETY BOILER WORKS,

Clearfield & 17th Sts., - - - - - - - - Philadelphia, Pa.

attached to the hoisting engine to make the derrick and compressor in one plant.

The Dings Electro-Magnetic Separator Co., Milwaukee, Wis., has recently installed one of their separators in the plant of the Christensen Engineering Co., Milwaukee.

The Chicago Bridge & Iron Co., Chicago, has received a contract for the construction of a water tower at Washington Heights, Ill. The contract calls for the erection of a steel tower with a capacity of 180,000 gallons.

The Garden City Sand Co., Chicago, report that its sales for the month of April exceeded by 15 per cent the sales of the same month last year.

The Maywood Foundry & Machine Co., Maywood, Ill., has moved its Chicago offices from the Monadnock Block to the Tacoma Building.

The Sligo Iron Store Co., 949 N. Second St., St. Louis, Mo., will build a warehouse to cost $18,000.

The Muncie Gas Engine & Supply Co., Muncie, Ind., which was recently organized with a capital of $80,000, is having plans prepared for a factory.

The Illinois Pneumatic Power Co., Chicago, has been incorporated with a capital stock of $100,000. The company will operate power, light, heat and refrigerating plants. The incorporators are W. J. Burdsall, Gust. Hallstein and James Gilloley.

The Hager Steel & Iron Co., Chicago, has been incorporated at Springfield with a capital of $100,000. The incorporators are Charles Hager, August W. Hager and Louis Hager.

G. A. Mullins, 226 LaSalle St., Chicago, has closed contracts with the Henderson Electric Light & Power Co., Henderson, Ky., for a 28x48 direct-connected Bates-Corliss engine, and with the Springfield Consolidated Railroad Co., Springfield, Ill., for an engine the same size. He is also making the third installation of the Lynn vertical water tube boiler at the Emelyn Iron Works, East Chicago, Ind.

Charles H. Besly & Co., 10 North Canal St., Chicago, report their general business very good. At this season of the year they are making large shipments of Helmet oil, Bonanza oil cups and the new Badger oil cups, in which Helmet oil is used. At their factory at Beloit, Wis., they are very busy in the tap department and are running 22 hours in the oil cup department. There is an unprecedented sale of Gardner disc grinders, shipment having been made of an entire carload of these grinders on orders for delivery in New York, Pennsylvania and New England. The new 300 page illustrated catalogue of this company will be mailed free to any address.

W. C. Heimbuecher & Co., 36 La Salle St., Chicago., have moved into more commodious quarters and now occupy suite 205, 207 and 208 in the same building on the corner of Lake and La Salle. They are mill representatives for the sale of galvanized and black sheet iron and steel, rivets, shafting, wire nails, bar iron and steel, nuts, washers, chain, etc.

Hickman, Williams & Co., The Rookery, Chicago, have opened an office in St. Louis, which will be in charge of Ben P. Williams.

General Industrial Notes:—

The Minor Fire Brick Co., of Cleveland, whose factory on the Ohio river at Empire, O., was destroyed by fire last year, has finished the construction of a new and much larger one on the same site. This new plant has been built in a substantial manner with brick and stone, practically fire proof, with a capacity of 12,000,000 brick per annum. Joel H. Fuller, president and treasurer of the Stowe-Fuller Co. of Cleveland, has been made vice-president of the Minor Fire Brick Co., and states that judging from the orders now being booked, the large capacity of the Minor plant will be taxed to the utmost during the current year.

The S. M. York Machinery Co., of Cleveland, announces that after May 15, its office and warerooms will be located at 263-265 St. Clair St., where it will have better facilities for serving its customers.

A Youngstown, O., dispatch says: No strike of the machinists will be declared here on May 20, when the new

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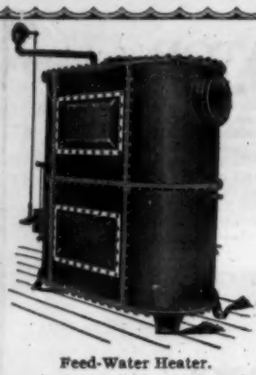
Western Office: ST. LOUIS, MO.



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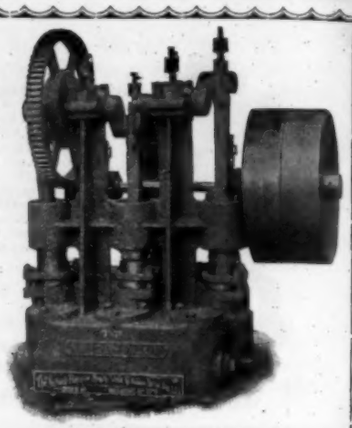


Triplex Boiler Feed Pump.

scale of the machinists throughout the country goes into effect. The manufacturers have notified their men that beginning on that date for 54 hours per week, or 9 hours per day, they would receive the same pay as was formerly given for 57 hours per week, or 9½ hours per day.

Within a week or ten days officers of the Republic Iron & Steel Co. and officials of the Amalgamated Association of Iron, Steel and Tin Workers of America will meet to discuss a proposition to be present at the Milwaukee convention of the association, which opens on May 21. The plan is designed to prevent the summer shut-down of plants employing men affiliated with the association, pending a settlement of the yearly wage scale. Since the men are in favor of doing away with the summer closing it is altogether probable that some agreement will be arrived at which will be ratified by the men in convention.

At a meeting of the central and trunk freight lines held in New York last week the petition of the iron and steel producers of the Valley and Pittsburg districts for lower freight rates was refused. The petition requested that rates on ore, pig iron and finished steel products from the lakes and Valley furnaces be reduced to the rates prevailing in 1899, but the railroads, without explanation denied the request. This ends the long campaign made by the Valley and Pittsburg shippers for lower rates, at least for the present. For the railroads the outlook for tonnage in these districts is even better than ever before. Everything points to a record-breaking tonnage during the summer months.

Hereafter no rails will be rolled at the rail mill of the National Steel Co. at Youngstown, O. Last week the mill was taken off rails and will hereafter confine its output to tin and sheet bars. The rails contracted for rolling at this mill will be rolled at the Edgar Thomson plant of the Carnegie Steel Co. and at the Lorain and South Chicago plants of the Federal Steel Co. There is no truth in the report that the mill will be dismantled and will be removed to Chicago. The move was made in order to centralize rail production and to increase the tin and sheet bar output for the sheet and tin plate plants of the United States Steel Corporation.

A shipment of drills and lathes has been made to Glasgow, Scotland, by the Hamilton Machine Tool Co., Hamilton, O.

The Summit Wire Co., Cuyahoga Falls, O., is putting in some additional machinery, in the operation of which power from the water falls will be utilized. The company manufacturers annealed, bright and coppered market wire, tinned mattress and broom wire.

Two Weimer engines are to be installed at the Atlantic Furnace of the Republic Iron & Steel Co. at New Castle, Pa. By an error a statement was recently made in these columns that Allis engines had been contracted for.

The first cast was made at the new open-hearth plant of the Cambria Steel Co. at Franklin, Pa., on May 2.

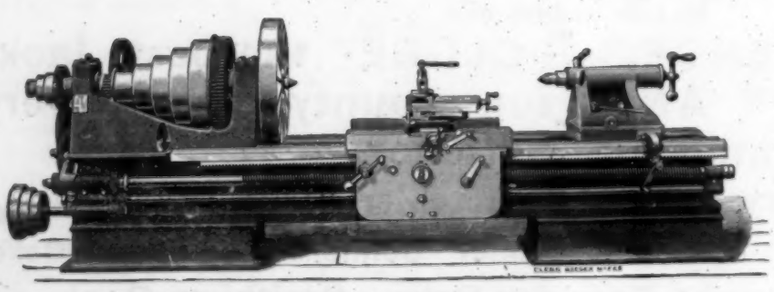
A Lebanon, Pa., dispatch says: The Cornwall Iron Company has sold to Edward C. Freeman, Isabel C. Freeman, Margaret C. Buckingham, R. Percy Alden and Sarah C. Derby, the twin Bird Coleman blast furnaces, including 1,600 acres of land here and at Cornwall. The property is estimated to be worth $1,000,000.

The Cooke Locomotive Works, in Paterson, N. J., have been purchased by the International Power Co., and George H. Longbottom, former president of the Rogers Locomotive Co., has signed a contract to become manager of the new concern. The present Cooke plant is modern, but it is proposed to enlarge it so that 5,000 men will be employed.

A committee has been appointed by Warren, O., Business Men's Association to call on the officers of the National Tube Co. for the purpose of requesting them to operate the Warren plant. This plant has been idle since the formation of the tube combine.

The labor troubles at the Riverside plant of the National Tube Co., located at Wheeling, W. Va., were adjusted last week, the tube men receiving an advance amounting to 10 per

Schumacher & Boye, CINCINNATI, O.



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cent. The laborers were also granted an increase of 10 cents a day while their time was reduced from 10½ to 10 hours.

The Brylgon Foundry at Harrisburg, Pa., was placed in operation last week. The new company will manufacture steel castings up to 15 tons in weight.

At a meeting of the Pawtucket Foundry Co. stockholders at Pawtucket, R. I., last week, officers were elected as follows: Edward Smith, president; F. A. Thomas, secretary and treasurer. The above named officers together with James H. Higgins, compose the board of directors.

The Lackawanna Iron & Steel Co. was granted permission last week to purchase from the state of New York 185 acres of land under water near the town of Hamburg, N. Y., at $25 per acre.

The plant of the American Tin Plate Co. located at Cumberland, Md., will again be placed in operation. Necessary repairs are now being made in order that the plant may resume at an early date.

The Chester plant of the American Sheet Steel Co., located at Chester, W. Va., will be dismantled and the machinery is to be distributed among the plants of the sheet combination in Ohio and Western Pennsylvania. The largest portion of the machinery will be installed in the Wellsville, O., plant.

The cast iron pipe founders seem to have all the work they can do. The Dimmick Pipe Co. of Birmingham, Ala., say that, while a short time ago the majority of orders only ran up into hundreds of tons, it is now nothing out of the ordinary to receive orders for 5,000 and 10,000-ton lots.

The Cleveland Punch & Shear Co. of Cleveland has sold to the William B. Pollock Co. of Youngstown, O., a 30-inch throat punch, weighing 40,000 pounds.

The Macungie Furnace of the Empire Iron & Steel Co. at Macungie, Pa., has been ordered closed down. It is altogether probable that it will be abandoned.

The huge steel floating drydock to be located at Algiers, La., near New Orleans, and now building by the Merian Steel Co. at Baltimore, Md., is practically completed. Nearly 7,000 tons of steel entered into the construction of the huge affair. The dock is 525 feet long, 100 feet wide across the entrance and 28 feet over the sill. It has a lifting capacity of 15,000 tons. The contract calls for placing the dock at Algiers and its removal will be a risky undertaking. The dock will not be removed until September.

The puddling department of the Wilkes Rolling Mill at Sharon, Pa., has resumed operations.

The two new stacks of the National Steel Co. at Mingo

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Drum fitted with clutch and will hold 3000 ft. of ½-in. rope.
One Hoist, same as above in all respects, ready for shipment in one week.
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GOVERNMENT WORK A SPECIALTY.

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KENTUCKY FIRE BRICK WORKS, PORTSMOUTH O. HIGH GRADE FIRE BRICK BEST BLAST FURNACE & ROLLING MILL BRICK
STEEL WORKS BRICK.
FIREBRICK, KY.

Junction, O., which have been under construction for some time were blown in last week.

The new plant of the Eastern Tube Co. at Zanesville, O., will not be placed in operation as early as expected. It was originally intended to commence operations in June, but now the indications are that operations will not be commenced until August.

It is announced on authority that the National Tube Co. will abandon the extensive improvements which were at one time planned for Wheeling, W. Va. The company will, however, complete the blast furnace which it started building nearly a year ago.

The Belmont Furnace of the Wheeling Steel & Iron Co. at Wheeling, W. Va., which has been out of blast for about two months, has been relined, a new skip hoist built, and all other equipment overhauled and improved. The fires will likely be lighted this week.

A general inspection has been made of what remains of the Crum Lynn Iron Works at Chester, Pa., which was recently burned. Some of the heavier machinery, the rolls and housings and the furnaces have been found to be but little damaged. Reconstruction of the plant will be started as soon as insurance claims are adjusted.

The report that the National Steel Co. will erect a new bar mill at the Aetna-Standard Works, at Bridgeport, O., is incorrect.

The Atlanta Co-operative Tin Plate Co. of Atlanta, Ga., will shortly commence the operation of their plant. The tin plate machinery was installed by the Birdsboro Foundry & Machine Co., located at Birdsboro, Pa.

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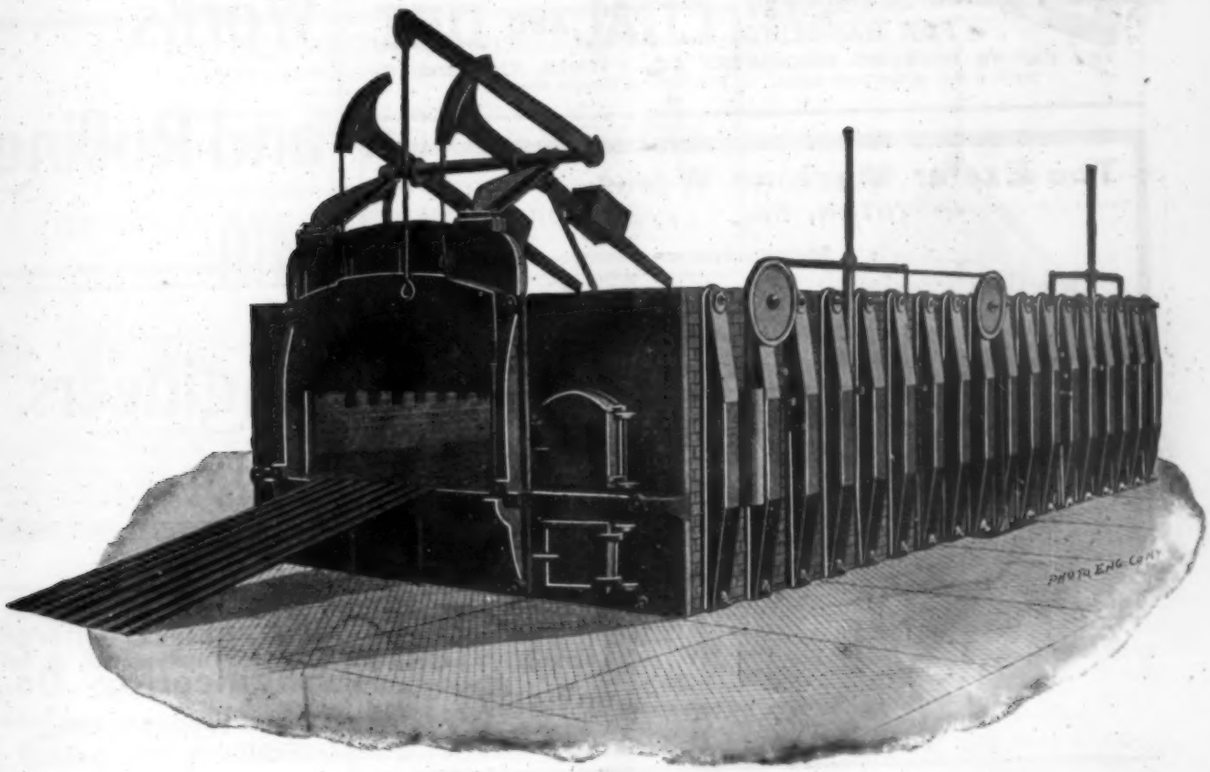

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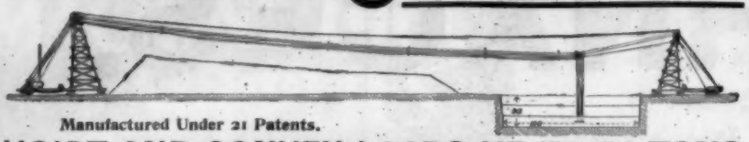

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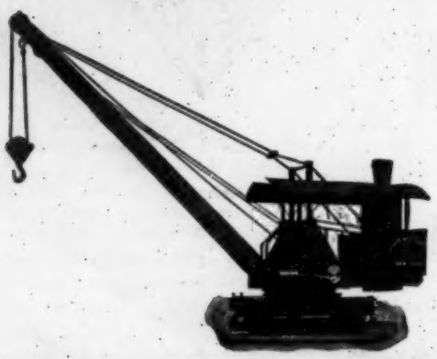

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15	13	11	Lorain Branch	10	14	16
P.M.	P.M.	A.M.		P.M.	A.M.	P.M.
4:00	1:05	7:00	Lorain	3:32	12:02	7:15
4:18	1:25	7:20	Elyria.....	3:14	11:45	6:59
4:36	1:53	7:43	Grafton	2:56	11:29	6:41
4:58	2:15	8:05	Lester Jun...	2:32	11:08	6:21

5	3	1	Main Line.	2	4	6
P.M.	P.M.	A.M.		A.M.	A.M	P.M.
5:10	1:35	7:50	Cleveland....	9:50	12:00	6:00
5:30	2:31	8:27	Lester Jun...	8:48	11:07	5:00
5:31	2:40	8:36	Medina	8:36	10:59	4:48
5:54	2:59	8:57	Seville.....	8:14	10:40	4:26
7:00	3:04	9:03	Sterling	8:03	10:34	4:20
7:22	3:24	9:24	Warwick.....	7:41	10:13	3:56
7:30	3:32	9:31	Canal Fult'n	7:34	10:06	3:48
7:50	3:50	9:50	Ar. Dep. Massillon.	7:15	9:50	3:30
				P.M.		
7:50	3:50	9:50	Dep. Ar.	7:50	9:50	3:30
8:05	4:06	10:05	Justus.....	7:34	9:35	3:13
8:35	4:37	10:36	Canal Dover	7:03	9:05	2:44
8:42	4:44	10:43	New Phila....	6:55	8:58	2:37
9:00	5:01	11:00	Ar. Dep. Urichsville	6:38	8:40	2:20
7 A.M.						
7:30	5:10	11:10	Dep. Ar.	6:38	8:40	2:20
8:06	5:43	11:42	Freeport	6:00	8:06	1:44
		P.M.				
8:32	6:07	12:05	Flushing	5:34	7:42	1:20
9:40	7:05	1:05	Bridgeport....	4:30	6:45	12:20

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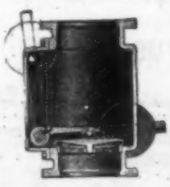

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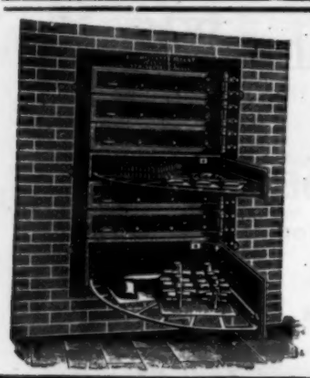

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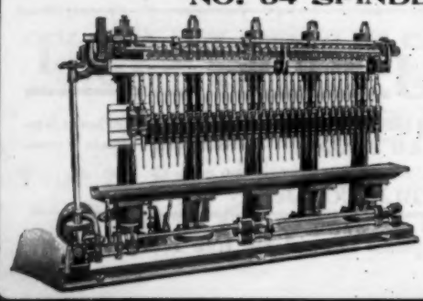

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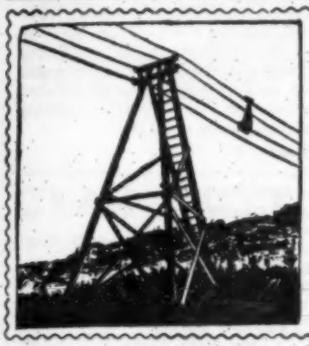

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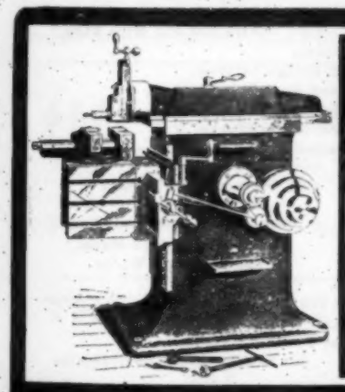

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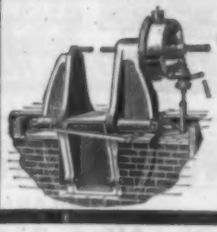

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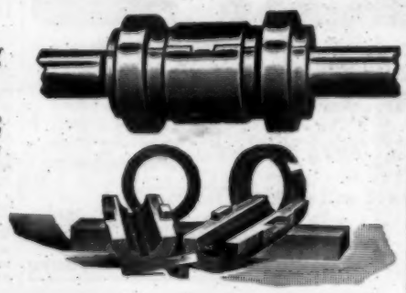

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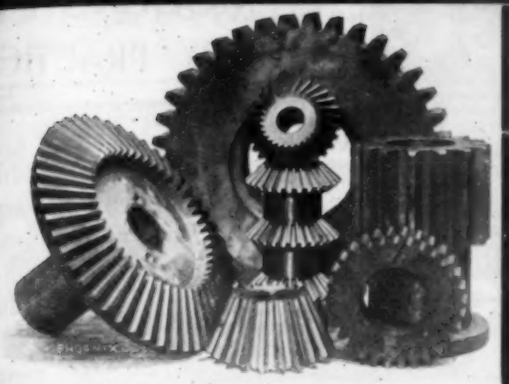

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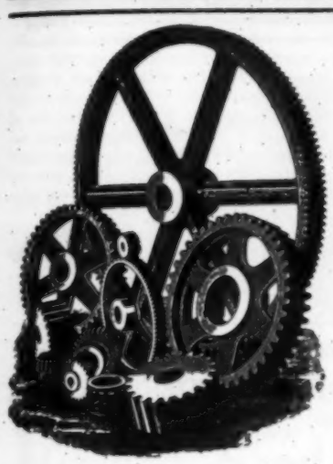

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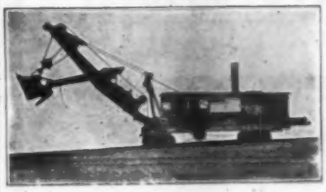

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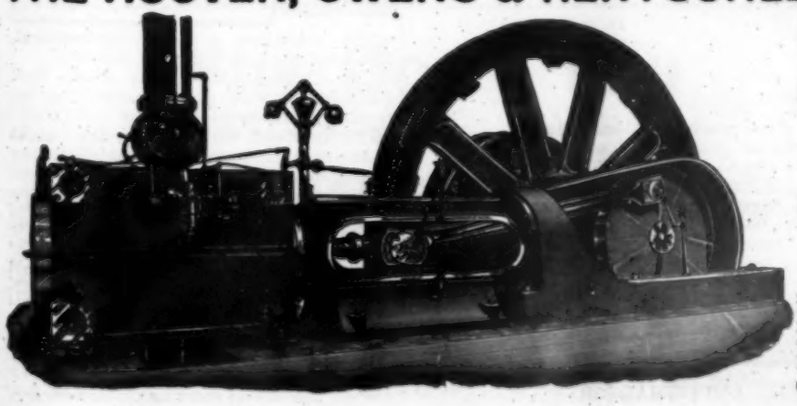

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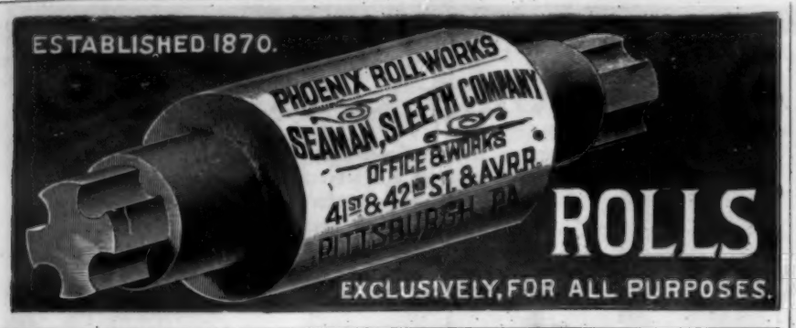

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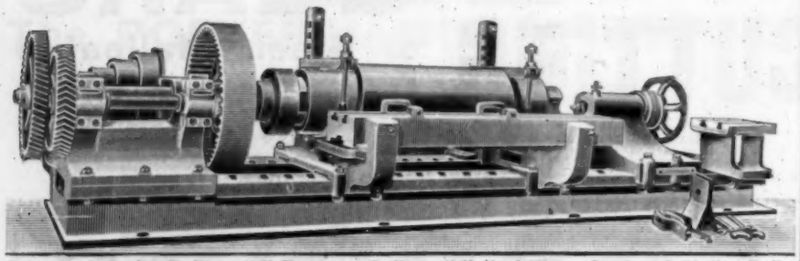

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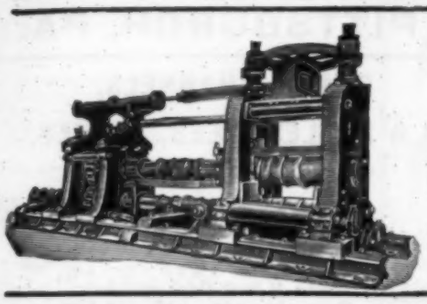

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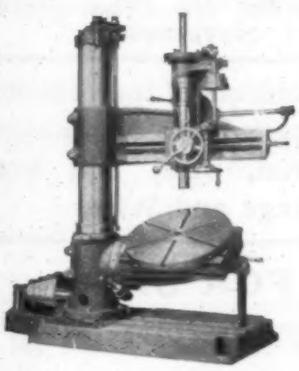

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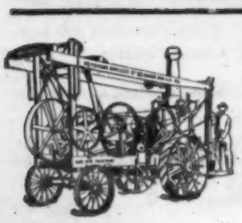

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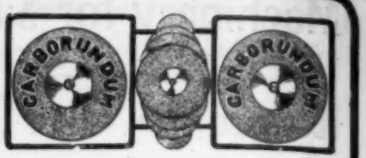

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